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A terraced slope, Natchie of Kili, Limassol District.

The Cyprus Agricultural Journal

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AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

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EDITORIAL NOTES

COLD and wet weather prevailed during January and consequently agricultural work was slowed down and growth of crop was poor. As most of the crops were planted before the severe winter condition set in and conditions have improved as the weather got warmer the forecast for the prospects for 1937 are hopeful.

Carob, almond and olive trees are making good progress and the marketing prospects for potatoes and onions are good.

The heavy losses among the grazing flocks which was reported last quarter continued, but the situation now shows indications of improving.

* * * * *

DIRECTOR OF AGRICULTURE'S VISIT TO EGYPT AND PALESTINE.

The Director of Agriculture has proceeded to Egypt and Palestine on duty in connection with various matters affecting the Department of Agriculture. Mr. Blunt left Cyprus on the 27th February for Egypt and returns *via* Palestine on the 10th March, 1937.

* * * * *

FLORA TOUR TO CYPRUS.

Messrs. Thos. Cook & Sons Ltd. have organized a Flora Tour to Cyprus. The first party of this tour arrived in Cyprus on the 28th February for a twelve days' stay in the Island. The tour is under the leadership of Mr. C. B. Ussher, formerly Government Horticulturist in Cyprus, and Mr. Hugh Roger Smith, Honorary Secretary, Alpine Garden Society.

* * * * *

HALF-YEARLY MEETING OF AGRICULTURAL OFFICERS.

The half-yearly meeting of Agricultural Officers in charge of Districts was held at Nicosia on the 15th January, 1937. The following Officers were present: The Director of Agriculture (Chairman), the Assistant Director of Agriculture, the Superintendent of Agriculture, Messrs. Pelagias, Klokkaris, Panaretos, Papaioovou, Maratheftis, Hakki, Kyprianides, and Hamboullas.

ARBOR DAY.

Arbor Day for 1937 was celebrated on the 29th January by Moslem Schools and 30th January by Greek Schools. Schoolmasters received assistance from Officers of the Agricultural, Forestry and Educational Departments in the celebrations.

* * * * *

ORANGE DAY CELEBRATIONS.

The third annual Orange Day celebrations were held at Famagusta on the 24th January, 1937. A programme of events covering the whole day was arranged, but owing to unfavourable weather most of the celebrations were held indoors.

* * * * *

VILLAGE AGRICULTURAL CLUBS.

The Cup presented by the Old Students Club of the Cyprus Agricultural School which is competed for annually by the Village Agricultural Clubs or Societies has been awarded to Lysi Agricultural Club this year.

* * * * *

FOURTH INTERNATIONAL GRASSLAND CONGRESS.

The Fourth International Grassland Congress is to be held in Great Britain in July, 1937.

The paper reading sessions will be held at Aberystwyth from 13th to 19th July.

Tours of centres of grassland interest and selected farms have been arranged so that participants will have an opportunity to see something of British grassland farming, including livestock management, both before and after the paper reading sessions.

Further particulars regarding the programme and application form for membership are available at the office of the Director of Agriculture.

* * * * *

SILKWORM EGG PRODUCTION.

The amount of silkworm eggs available for the 1937 sericultural season is 4,568 ounces, of which 3,418 ounces were produced locally and 1,150 ounces imported.

All the silkworm eggs were hibernated at Pedhoulas and were removed for disposal on the 20th February, 1937.

* * * * *

SERICULTURAL STATION, KALOPANAYIOTIS.

A total of 89 ounces (712 drams) of selected silkworm eggs of different races and crossings was produced in the Sericultural Station, Kalopanayiotis, and is available for sale this sericultural season, primarily to silkworm egg producers for reproduction and improvement of their own races. These eggs will be sold at the usual price of 4½p. per dram (4s. per ounce).

About 150 drams of these silkworm eggs will be issued to girls' schools for demonstrational silkworm rearings.

SILKWORM REARING IN GIRLS' SCHOOLS.

The Agricultural Department, in consultation with the Education Department, have arranged for demonstrational silkworm rearings to be carried out this season in 120 girls' schools the required silkworm eggs (one dram to each school) being supplied by this Department.

The rearings will be carried out by the girls of the three upper classes under the supervision of the schoolmistress.

These schools will be visited by the Sericultural and Agricultural Officers of this Department who will give the necessary instructions.

Prizes will be awarded to schoolmistresses on the same lines as last year.

* * * * *

LIST OF SILKWORM EGG PRODUCERS LICENSED FOR THE YEAR, 1937-1938.

<i>Name</i>					<i>Village</i>
1. Achilleas Markantonides	..	..	..	..	Kalopanayiotis
2. Ioannis Karamichailis	..	..	..	..	do.
3. Nicolas Ch. Taliadoros & Son	..	..	..	..	do.
4. Savvas G. Katalanos	..	..	..	..	do.
5. Sofoclis K. Michaelides	..	..	..	..	do.
6. Charalambos Leptos	..	..	..	..	Moutoullas
7. Costas I. Michaelides	..	..	..	..	do.
8. Miltiades K. Ioannides	..	..	..	..	do.
9. Miltiades Charalambides	..	..	..	..	do.
10. Socratis I. Michaelides	..	..	..	..	do.
11. Loizos M. Koullouros	..	..	..	..	Pedhoulas
12. Socratis Karamichailis	..	..	..	..	do.
13. Serghios S. Pavlou	..	..	..	..	Nikos
14. Xenis I. Xenides	..	..	..	..	Kondea
15. Theodora Eliadou	..	..	..	..	Famagusta
16. Ioannis Papaloizou	..	..	..	..	Galata
17. Anthimos Eliades	..	..	..	..	Alona
18. Cleanthis Christodoulides	..	..	..	..	do.
19. Anna Karapataki	..	..	..	..	Kambos
20. George A. Englezakis	..	..	..	..	Mesoyi
21. Nicolas Economou	..	..	..	..	Kissonerga,

Cereal Crops.

CEREAL crops are those which produce edible grain. The main cereals grown in Cyprus are wheat, barley and oats, the two former being by far the most important.

SEED AND SOWING.

It is important that seed used for sowing should be carefully selected and should fulfil the following requirements :—

(1) *Purity*.—Seed should be free from all shrivelled and damaged grains and from weed seeds, etc., and should come from a vigorously growing crop that possessed the desired varietal characteristics.

(2) *Ability to germinate*.—The seed should have a germination percentage of 90% to 95%. To accomplish this it must be harvested when fully ripe and carefully threshed. A low germination percentage will result from the use of seed harvested when still green, broken seed due to improper threshing or seed stored for over a year.

It is also advisable to pass the seed through a seed corn dressing machine before sowing in order to remove any foreign matter or shrivelled seed.

There are two methods of sowing :—

(1) *Broadcasting*.—This is simply scattering the seed by hand and is the method generally practised in Cyprus.

(2) *Drill-sowing*.—This method involves sowing in rows by machine and has many advantages over broadcasting. A uniform sowing at a regular depth is assured, leading to an even germination and ripening. Less seed is used, the plants are more resistant to disease due to the even spacing and, most important, the regular rows permit proper hoeing and weeding after the plants have germinated.

For germination, the seeds must have water, warmth and air, these conditions being best fulfilled in the field if the seeds are covered with earth to a depth of 5-8 times their average width. Sowing too shallow risks drying out, while too deep sowing may lead to lack of aeration and the exhaustion of the seedling before it reaches the surface. It is important that all seeds should be covered as uniformly as possible.

CULTURAL OPERATIONS.

Cultural operations include deep cultivation (*e.g.* ploughing) and surface cultivations (*e.g.* harrowing, rolling and hoeing) and may be taken to mean all operations applied to the soil to make it loose, well-aerated and suitable to plant growth.

The objects of ploughing are threefold :—

(1) It inverts the soil so that air may penetrate freely and assist in the process of nitrification.

(2) Weeds are destroyed.

(3) Any animal manure, green manure or fertilizer is turned into the soil.

Depths of ploughing vary, but there are three main groups :—

(1) *Stubble ploughing*.—This is carried out immediately after harvest to turn under all stubble and weeds, thereby adding organic matter to the soil and preventing the weeds from multiplying by seeding.

(2) *Ordinary ploughing*.—This refers to ploughing in the autumn, which turns under manure and breaks up the land preparatory to sowing.

(3) *Deep ploughing*.—Some crops respond to a greater depth of soil and are consequently given deeper cultivation. A deep ploughing at intervals is very beneficial to the soil, but care must be taken not to plough too deep, as this often tends to bring the infertile sub-soil to the surface. If very deep cultivation should be necessary, a sub-soiler is used, which stirs the sub-soil without bringing it upwards.

After ploughing, the land should be harrowed in order to cover the seed and get the top soil into a finely divided condition. Rolling is also good practice, as it tends to press the soil around the seed and assist germination. Fields are also rolled after germination to assist tillering, which is the growth of more shoots from one root. If the crop has been drill-sown it is possible to hoe around the plants after they have appeared above the surface. The objects of hoeing are twofold: weeds, that compete with the crop for light, air and food, are eradicated, and the soil around the plants is kept in a finely ground tilth which conserves moisture and materially aids in their uptake of nutrients.

WHEAT.

Wheat grows best on a well-aerated, rather clayey loam, but will grow on a wide variety of soils if suitably manured. It responds well to nitrogen and phosphate, but requires little potash. Too much nitrogen tends towards straw production at the expense of grain, while phosphatic fertilizers moderate the effects of nitrogen and principally contribute to the production of seed. Manuring and cultivation of wheat falls into three main divisions:—

(1) After a bare fallow, the soil is usually loose and a fairly deep ploughing should be carried out. A good dressing of farmyard manure and some 30 to 50 okes of super-phosphate per donum will be an adequate manurial dressing in most cases, though this must be varied to suit different soil conditions.

(2) When following cleaning crops, a shallower ploughing is sufficient. The cleaning crops have usually received a dressing of farmyard manure and, in this case, only super-phosphate need be applied to the wheat. A top dressing of nitrate of soda can be given to the crop later on, if it looks poor.

(3) If wheat is grown after a leguminous crop (lucerne, broad beans, chickling vetches, haricots, cowpeas, etc.), a shallow ploughing, given a month before sowing, is followed by a deeper ploughing just before sowing. Nitrogenous fertilizers and animal manure may be omitted, but super-phosphate is advisable.

Seeds may be broadcast or drill-sown, and germination is rapid, provided the soil is moist, well aerated and above six degrees centigrade in temperature. The amount of seed sown is very variable and depends on the manner of sowing. Broadcasting on poor soils will take about 14 okes per donum, while drill sowing on fertile soil may require as little as 8 okes of seed.

Tillering of wheat takes place at a temperature of over nine degrees centigrade and consists of the development of secondary shoots growing from the first subterranean node. Tillering is encouraged by low seed rates and fertile soil as well as by harrowing, rolling and nitrogenous fertilizers. In general, cultivation of wheat after germination proceeds as follows: Clay soils are harrowed in order to break up any crust that may be forming on the surface and light soils should be rolled to assist

rooting and tillering. Top dressings of nitrogenous fertilizers (if necessary) are applied simultaneously with the above operations, a suitable dressing being 15 to 20 okes of nitrate of soda per donum. During growth the crop is weeded and hoed once or twice, which operations are facilitated if the crop is sown in rows. Irrigations are given when circumstances warrant, turbid water from torrents being especially beneficial for this purpose.

PRODUCTS OF WHEAT.

Wheat products after threshing are grain, straw and chaff, the proportions of each varying with variety, fertilizer used, kinds of soil, etc. In general, the proportion of grain to straw is 50 % and straw to chaff 18 %.

The grain is used for bread-making and the straw for animal fodder or litter. Wheat seed contains about 60 % starch and 13 % gluten, 100 okes of wheat yielding 75 okes of flour, 22 okes of bran and 3 okes of semolina (produced from the embryo of the seed).

There are about 52 varieties of wheat in Cyprus, all except two belonging to the class of hard wheats. The following varieties are those mainly cultivated, four-fifths of the cultivation being under the first three varieties :—

- (1) Kyperounda, or Mavrokoutsoullo, or Athalassitiko.
- (2) Psathas, or Yerolachitiko, or Athienitiko.
- (3) Tripolitiko, or Paphitiko, or Chrysositaro.
- (4) Mavrotheri.
- (5) Kambouriko.
- (6) Vroullos.

BARLEY.

Barley grain is used in Cyprus mainly for animal fodder, but is also used for bread-making either by itself or in combination with wheat. A large proportion of the crop is exported and used for malting purposes.

As barley matures early in the spring, it is not affected by dry weather in March, which may mean the ruin of the wheat crop. Wheat depends on a fair amount of rain in March and a little in April, without which the harvest will be unprofitable, but barley is approaching maturity in March and its success is fully assured, provided it rained adequately in January and February, which is usually the case in Cyprus.

Barley growing is a profitable undertaking. It grows well under poorer conditions than wheat, it is unlikely to fail, export markets remove the surplus and animals can be raised economically on the remainder ; the disposal of animals locally and abroad being very remunerative.

Although barley thrives under poor conditions and its nutrient requirements are less than wheat, it nevertheless pays to apply chemical fertilizers which produce early maturity and a large harvest. Nitrogenous fertilizers give good results, but when the barley is intended for brewing purposes, it is advisable to limit the nitrogen supply, as a barley rich in starch and poor in nitrogenous matter is required. In general, the proportion of seed to straw is 3-1. The usual seed rate is 13 okes per donum. The following varieties are grown in Cyprus :—

(1) The six-rowed Paphitiko, which is grown in the Paphos District and the hills round Limassol. It is a late-maturing variety, very productive, rich in starch and suitable for brewing purposes. One kilé of this variety weighs from 18 to 20 okes.

(2) The Mavrokitharon, a variety grown in the Mesaoria and other districts. It is poorer in yield than Paphitiko, but earlier maturing. A kilé weighs from 15 to 17 okes.

(3) The Exastihon, which is intermediate in quality and yields between the two varieties above. It is cultivated on a large scale on the plains. A kilé weighs 16 to 18 okes.

Barley is also grown for green fodder, (*farras*), in which case a higher seed-rate of 16 to 17 okes per donum is advisable. It can be used for hay-making in combination with vicos or other leguminous crop with a seed-rate of 17 okes barley and 4 okes vicos. In the latter case, the crop is cut when the ears begin to appear and left to dry in the field for two days after which it is turned and left for a further two days. It is then gathered and stacked in the yard. On every layer a small quantity of salt is sprinkled, say 3 to 4 okes per 1,000 okes hay, and the top of the stack is covered with a heavier layer of rye or other cereal straw.

OATS.

Oats will thrive on most soils, but they require a large amount of water and a good supply of nutrients. The hardness of the crop is due to a well-developed root system, which draws on reserves of plant food in the soil that are not available for wheat or barley. The crop does not require much fertilizing with the exception of nitrogen, which it absorbs all through its growing period. Oats readily respond to nitrogenous fertilizers and, when these are supplied, yields a heavy crop.

The duration of the crop varies from 90 to 150 days. The proportion of grain to straw is 2 to 1. The grain is used for fodder and the straw can also be used for this purpose, though it is mainly used for litter. In rotation, oats may follow any crop. The seed-rate is 12 okes per donum, about one kilé, and seed from the previous crop should always be sown.

There are no good varieties of oats in Cyprus and for this reason selected varieties from abroad are being tried at the central experimental farm at Morphou with a view to replacing the local ones.

The crop can also be grown for a late green fodder for feeding to animals when no other fodder is available. In the green state it is given to stock after blossoming, as previous to this it is bitter and unpalatable.

RYE.

This crop is grown on lands on which wheat does not thrive. It is the most suitable cereal for light and hilly soils in infertile areas and is more drought and cold resistant than wheat. It can be grown up to 2,200 meters and little attention need be paid to manuring. The seed-rate is 12 okes per donum and the crop is generally sown later than barley, but earlier than wheat. Rye flour is poor in starch, but rich in protein. The straw is used in the manufacture of hats and other straw articles; also for covering haystacks and in the construction of huts and simple roofing.

HARVESTING OF CEREALS.

Cereals should be harvested when the seed is like wax and can still be cut with the nail, and not allowed to remain until it gets hard. Harvesting at the right time obtains grain containing the maximum amount of flour and the minimum amount of bran. Consequently its yield in terms of bread will be higher and it will be more acceptable to the miller.

Harvesting can be done by hand or by machine. One man with a sickle, followed by a woman to tie the sheaves, can harvest one donum daily at a cost of 3 to 4 shillings. The operation is greatly speeded up by the use of machines of which there are several types. A simple reaping machine, drawn by a pair of oxen, can reap 15 donums daily, with 12 women to tie the sheaves, at a cost of 15*g*. per donum or about half the cost of hand reaping. Binder and combine machines effect still greater economies on large areas. Other advantages gained by the use of machines are :—

- (1) Greater yield of straw.
- (2) Operation can be started and finished at the best time.
- (3) Losses caused by unfavourable weather during harvest are minimized.
- (4) Losses caused by animals and birds are avoided.

Harvesting should be commenced just prior to full maturity, especially in the case of wheat, and the drying process completed in the field before the sheaves are removed to the threshing-floor. If rain appears imminent the sheaves should be "stooked" in the field and not left lying on the ground. By this means less rain will enter the sheaf and the rain that does enter will dry out more rapidly. Sheaves are arranged in small stacks with the ears inside where they remain for 10 to 15 days before being threshed. If rain falls during this period, the stacks should be opened to allow the ears to dry.

Threshing usually begins with the barley crop and ends with the oats, the operation being done by animals or machine. In Cyprus the threshing is usually done by means of the primitive threshing-board, which method at first sight appears to be most economical for the farmer and particularly for the small-holder. The disadvantages, enumerated below, are such, however, that even the most conservative farmers must realize that it is high time for this method to be abandoned :—

(1) Threshing 200 kilés of wheat with one pair of oxen requires 30 days and 3 to 4 days more for winnowing, as opposed to the operation being done in a single day by machine. The following day will see the seed and straw stacked and stored.

(2) A pair of oxen eat a kilé of seed a day during the threshing process and more is destroyed by birds the longer the crop stays exposed.

(3) Rain or hail storms, which are liable to occur at threshing time may destroy a portion or even the whole crop. Speed of work minimizes this danger.

(4) The time spent in threshing might possibly be spent by the farmer in preparing the land for summer crops or stubble ploughing, which enriches the land for the next crop.

Hitherto the Cypriot farmers have complained that the straw produced by machine was coarse and unsuitable for feeding to stock. The equipment of modern machines, however, prepares the straw similarly to that produced by threshing on the threshing-board.

The seed store should be dry and well ventilated and fumigated before the seed is stored. It is also advisable to limewash the walls with a lime solution containing 2% to 3% copper sulphate. The seed layer should not be more than 50 to 70 cm. in depth and the seed must be stirred from time to time with a shovel to keep it well aerated. If intended for long storage, it should be mixed with a small quantity of sulphur.

JUDGING OF CEREALS.

The quality of a sample of grain is judged on a number of points which are briefly as follows :—

(1) *Weight of a kilé*.—This is important so far as heavy grain possesses more feeding value than light. Good wheat weighs around 22 okes per kilé and poor samples weigh considerably less. Oats weigh about 12 okes per kilé and in this crop a good weight is especially important as it indicates that the grain is well filled out and mature.

(2) *Purity*.—Grain is usually contaminated to a large or small degree with dirt, weed seeds, worthless grain and other impurities. There are several kinds of worthless grain : Shrivelled seeds are due to arrested development during growth caused by climatic conditions or disease. Sprouted grain, showing the dried end of a sprout, may be due to dampness after storage. Excessive broken grain is due to careless threshing. These impurities can be brought down to a minimum by careful treatment.

(3) *Uniformity of Size and Colour*.—Uniformity may not be of value for feeding purposes, but it is always desirable for seed purposes and to keep a variety true to type.

(4) *Presence of Disease, i.e. Smut or Rust*.—An excessive amount of diseased grain may impair the food value of the grain. Grain improperly stored soon becomes musty and unfit for consumption. Diseased grain must not be used for sowing.

From the remarks above it is seen that an ideal wheat sample would weigh 22 okes per kilé, would be composed of large uniform grain with a minimum of impurities and would be free from any hint of smut or rust. This is the wheat that all farmers can produce if care is taken.

GENERAL PESTS.

The chief pest of cereals is the *Sirividhi* (*Syringopais* (*Nochelodes*) *temperatella*, *Led.*), which causes serious damage to crops in some localities. This insect lays its eggs in the soil in April and although these eggs hatch soon afterwards the young larvae remain in the soil without feeding until the cereals have commenced to grow in the following December. The larvae then feed within the thickness of the leaf until about the end of March, the adult insects appearing again in April.

The damage caused is very conspicuous in March and April when the attacked plants turn brown and dry up, and in cases of severe infestation the whole crop may be destroyed.

Measures used against this pest are : Leaving the land fallow or at least avoiding the growth of cereal crops and insuring the destruction of weeds by thorough ploughing, preferably by means of an iron plough, and clearing banks, etc. ; burning the stubble ; not growing cereals on the same land in successive years ; grazing the crop by sheep at an early stage of the attack, so that the larvae in the leaves are destroyed, and the crop is then able to grow up again.

THE HESSIAN FLY (*Mayetiola destructor*, *Say.*)—causes damage to wheat and barley in many places, and is most conspicuous in January when infested plants appear stunted and thickened and their central shoot is often destroyed.

The larvae of this insect live in the lower part of the stem of the young plant, and the pupae may be found in this position later, the pupae having the appearance of flax seeds.

The attack of this insect is often confused with that of the Sirividhi (*Nochelodes temperatella*) but the larvae of the latter live within the thickness of the leaf and not in the stem as is the habit of the larvae of the Hessian Fly.

Damage by this insect is prevented by not sowing wheat and barley too early. It is not possible to give a definite date before which sowing should not be carried out owing to annual variation in the commencement of the rains, but it is usually found that the earliest-sown fields are the most severely attacked. Self-sown wheat and barley should be prevented from growing by cultivation of fallows, and the stubbles of infested fields should be thoroughly ploughed as early as possible after harvest.

DISEASES OF CEREALS.

The most important diseases of cereals in Cyprus fall into two main classes namely the rusts and the smuts.

The rusts are well known by the red powdery masses which appear on the leaves, stems and heads of wheat and barley and on the leaves of oats and maize.

On wheat three rusts are known to occur in Cyprus, these are the yellow rust which is the first to appear and damages the young wheat plants; the brown or leaf rust which attacks the leaves of the mature plants and the black or stem rust which attacks all the above ground parts. Of these three the stem rust is the most serious and, when the attack is severe, the plant is weakened and produces shrivelled worthless grain.

Rust attacks on wheat depend almost entirely on the season; in a dry season they may not be seen at all but in a season when the period of the rains extends almost to the harvest great loss may ensue. Late crops as a rule suffer more than early maturity ones and irrigated crops more than rain crops. All the local varieties are liable to be attacked by the stem and the leaf rusts.

Barley is attacked by the stem rust and the leaf rust but these attacks are rarely of importance except on crops grown late in the season for green food.

Oats are liable to exceptionally severe attacks of the oat rust so much so that sometimes the clothes and boots are reddened when walking through the crop.

Spraying against cereal rusts is of no value and growers are largely at the mercy of the weather. Early sowing of early maturity varieties is the only course which is likely to reduce the loss in a bad "rust" season.

The smuts are common diseases which attack various parts of plants. They are so called because the grain is replaced by a black powdery mass. In cereals the smuts are most familiar on the heads. Everyone has noticed the blackened ears or the naked heads standing up in a field of wheat, oats or barley.

The following are the head smuts met with and it will be seen that these fall into two groups—those in which the black powdery mass in the grain blows away before harvest—the loose or open smuts, and those in which the black mass remains enclosed within the scales—the closed or covered smuts.

The life histories of these two groups of fungi are very different and have an important bearing on the measure used to control them.

In the closed smuts the black spore mass is protected by the scales so that it is not liberated until broken up in the threshing process. Here healthy grains become contaminated and on being sown produce a diseased crop. If, therefore, the contaminated grain can be treated with some poison to kill the fungus on its outside, clean crops will result.

In the loose smuts the spores of the fungus are liberated while in the field at flowering time. They are blown about the field and alight on open flowers in the same way as pollen grains do. Here the fungus enters the developing grain and remains inside until the grain germinates. Being inside it is clear that no treatment of poisons will be effective. The only way to destroy it is to soak the grain in water hot enough to kill the fungus but not the grain. It is not an operation that a farmer can do. If a field is seen to have much loose smut it should not be used for seed.

The following is a summary of the smuts and their treatment :—

WHEAT.—*Covered Smut*.—Treat the grain with copper carbonate power.—18 drams to a “ kilo ”.

Loose Smut.—Use seed from a crop free from the disease.

BARLEY.—*Covered Smut*.—Treat the seed with sulphur.—1 oke to 11 “ kilos ” of grain.

Loose Smut.—Use seed from a crop free from the disease.

OATS.—*Covered Smut*. } Treat the grain with formalin solution—

Loose Smut. } 12½ drams to 10 okes water.

Full instruction as to the use of these poisons will be found in the article on cereal diseases in the *Cyprus Agricultural Journal*, September, 1933, and September, 1934.

FLAG OR LEAF SMUT OF WHEAT.

One of the smut diseases attacks the leaves of the young wheat plants. This is a serious disease and causes much loss to the wheat crop in all parts of the Island.

Dark streaks appear on the leaves and the plant assumes a twisted appearance—the skin over the streaks eventually bursts liberating the spores. These can remain in the soil a number of years and attack subsequent crops of wheat only. The treatment of the seed with formalin is effective when the grain is contaminated but no treatment will destroy the fungus in the soil.—Use seed, therefore, from clean crops and so avoid contaminating healthy land.

As a precaution against this disease and against the covered smut, seed wheat should always be disinfected before sowing.



Diseases of Sheep and Goats.

(With Special Reference to Cyprus.)

By R. MOYLAN GAMBLES, *Veterinary Officer.*

[Continued from December issue.]

PART II.—DISEASES CAUSED BY ANIMAL PARASITES.

Piroplasmosis. (Red-Water. Tick-Fever).—This is caused by a protozoan parasite, a very minute pear-shaped animal called a piroplasm, which invades the red blood corpuscles. Most species of domestic animals are susceptible, but each has its own particular species of piroplasm. The red blood cells are usually destroyed in large numbers, and the red pigment of the blood escapes, and is excreted by the kidneys, giving the urine a red or dark brown colour. In some forms of the disease this is not seen.

The first sign of the disease is a general febrile reaction. In acute forms of the disease the urine soon becomes red or brown, and is often frothy. It is usually accompanied by anaemia and jaundice, the mucous membranes losing their pink colour, and becoming pale and yellowish. Considerable numbers of the affected animals die from the disease. The disease is spread by the bites of ticks.

There is no fully confirmed record of piroplasmosis in Cyprus, although it has several times been suspected. It is probable that it does not occur here, for if it did, it would almost certainly be too widespread to be overlooked.

Coccidiosis.—This is caused by another minute protozoan parasite called a coccidium, which lives in the walls of the intestines. It passes out with the faeces, and infection occurs from grazing on contaminated pasture. The parasite is very common in Cyprus. Where present in small numbers, it causes little or no harm. But when in larger numbers, it causes diarrhoea, which may be blood-stained. In very severe cases, death occurs so suddenly that the disease resembles Anthrax.

The disease can be diagnosed by microscopic examination of the faeces. In Cyprus, Coccidiosis is usually accompanied by Stomach-worm infestation, and the two diseases are best controlled together by periodic dosing with copper sulphate.

Sarcocystosis.—This condition is caused by another protozoan parasite, called *Sarcocystis*, which causes small white oval cysts in the muscle of the oesophagus. These vary enormously in size, sometimes being two inches long, and sometimes too small to be visible to the naked eye. They appear to do little or no harm to the animal.

Parasitic Gastro-enteritis.—This disease is an inflammation of the stomach and intestines, caused by the presence of parasitic worms, and causes very serious losses every year in Cyprus. A large number of different species of worms are found in the alimentary canal of sheep and goats, both roundworms and tapeworms, but they are not all of equal importance in the production of disease.

The two most important are the twisted wireworm (*Haemonchus contortus*), a round worm varying in length from half to one and a half inches, the female being marked with spiral lines where the coiled uterus

shows through the skin; and the lesser stomachworm (*Ostertagia circumcincta*), a smaller and more slender worm, from a quarter to a half an inch in length. Both these worms, together with a rarer form, *Ostertagia ostertagi*, occur in the fourth stomach. *Haemonchus* does more harm than *Ostertagia*, owing to its larger size, and the large quantities of blood that it sucks from the mucous membrane of the stomach, but in Cyprus it is much less commonly found than is *Ostertagia*.

Other roundworms, of even smaller size than *Ostertagia*, species of *Trichostrongylus* and *Cooperia*, occur in the upper part of the small intestine and occasionally in the fourth stomach. Of these *Trichostrongylus vitrinus*, and *T. axei* have been found in Cyprus. Another worm, *Nematodirus*, half to one inch long, but more slender than *Haemonchus*, is also found in the small intestine, and is fairly common in Cyprus. None of these, however, cause very much trouble. Certain other roundworms are occasionally found in the large intestine, *Oesophagostomum venulosum*, *Chabertia ovina*, and the whipworm, *Trichuris ovis* which has a long slender head-end imbedded in the mucous membrane, and a much thicker hind-end free in the cavity of the intestine. None of these are particularly common, and they do very little harm. The eggs of these worms are passed with the faeces and fall on to the pastures. Under suitable conditions of temperature and moisture these hatch out into larvae, which after changing their skins several times, become infective, and if swallowed by the sheep or goat while grazing, will develop into the adult worm.

After *Haemonchus* and *Ostertagia*, the most important worms causing Parasitic Enteritis are the tapeworms, of which there are three kinds in Cyprus, viz : *Moniezia* (several species), a long broad, flat worm, usually found in quite young lambs and kids, *Acitellina centripunctata*, a long narrow worm, the hinder half of which is almost cylindrical, and *Stilesia globipunctata*, a much shorter worm, wider than the last and very thin, which is usually found very much twisted up. When present in large numbers, these worms can cause serious losses, although when they are only a few no harm is done. The life history of all the tapeworms of sheep and goats is totally unknown.

Animals affected with Parasitic Gastro-enteritis become pale, dull, thin, weak and show Diarrhoea. All these symptoms become steadily worse as the disease progresses. The appetite is usually unimpaired (except sometimes in the final stages when the animal is very near death), and there is no febrile reaction, unless the general weakness of the animal has allowed some other infection to enter. The animals look miserable, there may be soft watery swellings under the jaws or under the belly, and the wool is shaggy and sometimes easily pulled off.

Treatment with copper sulphate will frequently cure animals if the disease is not too far advanced, but obviously no medicine can be expected to save an animal which is at the point of death. Prevention is better than cure, and all flocks should be dosed regularly, instead of waiting for deaths to commence, as is so frequently done. Copper sulphate is issued, free of charge, in packets of two ounces, which being dissolved in 2½ pokes of water is sufficient for about fifty adult sheep or goats, the dose being one to two fluid ounces, according to age. This treatment is very efficient against *Haemonchus*, but somewhat less so against *Ostertagia* and tapeworms; even against these, however, it is a very useful drug. Although dosing will not by any means kill all the worms in the animal, it will

considerably reduce the numbers, and if carried out regularly prevents the symptoms of the disease from appearing. It is quite impossible to free a sheep or goat from parasites entirely, but as long as they are only present in small numbers they will do no harm. The efficacy of copper sulphate against *Ostertagia* and tapeworms is greatly increased by the addition of two fluid ounces of nicotine sulphate (containing 40% nicotine) to the contents of each packet. Periodic dosing and strict cleanliness of the *mandras* are the most important control measures that are practicable in Cyprus where pasture is so scanty. In some countries where pastures are richer and more plentiful, other methods can be used to help control the parasites. The flocks are not left on the same part of the pasture long enough to be able to swallow the infective larvae which develop from the eggs they have dropped in their faeces, but are moved to a new area every two or three weeks (the larvae take about three weeks to reach the infective state). The contaminated parts are left ungrazed for a long period (preferably about a year), or else ploughed up, and another crop sown. The infective larvae develop more plentifully where there is plenty of moisture, so all damp and marshy places are railed off, and the flocks not allowed to graze there. But under conditions such as are found in Cyprus, these methods are scarcely practicable, for every available pasture is required, and there is no time for any of them to be left empty for long. Also during most parts of the year, it is only in small marshy areas that any green food is available at all, and the benefit of the green food will probably more than balance the harm done by parasites they pick up there.

LIVER-FLUKE DISEASE (*Fascioliasis*, *Distomatosis*).—This disease is caused by a parasite which lives in the bile-ducts of the liver, a flat oval worm, about an inch long, called *Fasciola hepatica*. It is not widespread in the Island, and is confined to marshy and irrigated areas.

The egg of the worm is passed in faeces of the sheep, and when it falls into water, or is washed there by the rain, it hatches into a minute form which swims about in the water, and bores its way into a certain kind of snail. Inside the snail it undergoes various changes, and multiplies. Large numbers of the new form escape from the snail, and encyst on blades of grass and other plants growing at the water's edge. When these cysts are swallowed by sheep they hatch out, and bore through the walls of the intestine into the liver, where they settle down in the bile-ducts and reach maturity.

The symptoms of the disease are mainly anaemia (shown by paleness of the visible mucous membranes), weakness, and emaciation. Jaundice may also be present. The wool becomes brittle, the skin dry, and watery swellings occur, especially under the jaw. These symptoms get steadily worse, and if not treated promptly, large numbers of animals die. The disease can be definitely diagnosed by finding the eggs in the faeces. At post-mortem, the liver is seen to be enlarged, and the affected bile-ducts stand out as thick white lines, if they are cut open the parasites will be found. In old cases the whole liver is hard and tough (cirrhotic), and deposits of salts in the bile-ducts make them difficult to cut through.

Treatment consists of the administration of carbon tetrachloride, either in capsule form, or preferably injected direct into the first stomach, although the latter operation should only be carried out by a competent person. Snails can be killed by copper sulphate in very weak solution.

One part in a million is sufficient, so a little strong solution poured into pools and ditches, etc., and stirred up, will effectively kill any snails present. Wide marshy areas are best dealt with by drainage.

Hydatid Cyst, etc.—Sheep and goats are often infected with the intermediate stages of the tapeworms of dogs. The ripe segments of the tapeworms, full of eggs, are passed with the faeces of the dog, and contaminate the pastures. The sheep are infected by swallowing the eggs while grazing. By far the most important of these is the *Hydatid Cyst*, the intermediate stage of a very minute tapeworm of the dog, which has only three or four segments, and is less than half an inch long, *Echinococcus granulosus*. When the egg of this worm is swallowed, it hatches into a larva which bores through the wall of the intestine, and finds its way to the liver, lungs or spleen. Here it grows into a cyst usually half to one inch in diameter, but if left long enough may grow to the size of a man's head. This cyst is a source of danger, for if the sheep is at all roughly handled during herding up into the *mandra* or on any other occasion, it is liable to burst, and the animal dies almost immediately. Smaller cysts (and there are usually several of them in an affected animal) are also harmful to the sheep, for the functions of the liver or lungs are interfered with. Humans are also infected with the cyst, either from eating food contaminated with the eggs of the worm, or from handling dogs which have these tapeworms. When the dog passes faeces containing eggs or ripe segments of the worm, these may not all fall to the ground, and some may adhere to the skin around the tail, and be spread to other parts of the coat by licking. Anyone handling the dog may contaminate his hands, and may swallow an egg next time he puts his hand to his mouth. Dogs become infected with the tapeworms when they eat carcasses of sheep or goats containing the cysts, or infected portions of liver, lungs, etc., from slaughter-houses.

Another common cyst in Cyprus is *Cysticercus tenuicollis*, the intermediate stage of the dog-tapeworm *Taenia hydatigena*. It is spread in the same way, but is less harmful to the sheep, and does not affect man. It does not grow to nearly so large a size, and is usually found attached to the mesentery instead of in the liver.

Cysticercus ovis, which is a still smaller cyst, has not been found in Cyprus. It is the intermediate stage of *Taenia ovis*, another tapeworm of the dog.

A fourth kind of cyst occurs in sheep, and causes serious damage, but fortunately does not occur in Cyprus, *Coenurus cerebralis*, intermediate stage of *Taenia multiceps*. This cyst occurs in the brain. The affected sheep becomes dull and foolish, will not follow the flock, but walks round in circles, or runs its head up against an obstacle and stands still for the rest of the day. Eventually it cannot stand, and falls down.

There is no cure for these conditions (except the last, which can sometimes be removed surgically), but they can all be avoided by preventing dogs from carrying the adult worms. This is done by burying all carcasses deep, and by burning all the organs containing cysts when the animals are slaughtered for food. Domestic dogs should be dosed, to clear out the worms they carry, and stray dogs should be destroyed as far as possible.

LUNGWORM DISEASES (*Parasitic bronchitis* & *Vermineous Pneumonia*).—These diseases are caused by worms that invade the lungs. There are two kinds of worms, a long whitish worm about two to four inches long,

that lives in the bronchi and trachea, *Dictyocaulus filaria*, and a small brownish worm, half to one and a half inches long, that lives in the lung tissue, *Protostrongylus ocreatus*. Another worm, similar in appearance and habits to *Protostrongylus*, has also been recorded from Cyprus, *Muellerius capillaris*.

The life-history of *Dictyocaulus* is direct, in that the infective larva is swallowed by the sheep or goat, and bores through the intestine and makes its way to the lungs, and thence into the bronchi. The eggs it passes are coughed up and swallowed, and pass to the outside in the faeces. In *Protostrongylus* and *Muellerius* on the other hand, the young larva is swallowed by a snail, or else bores its way in. It reaches the infective stage in the snail's body, and the sheep or goat is infected by swallowing the snail while grazing.

Fortunately these diseases are not widespread through the Island, but are confined to certain districts. They are harder to control than are the intestinal worms. *Dictyocaulus* causes a chronic cough, and if present in large enough numbers, may choke the animal. Pneumonia may also be set up, secondary to the Bronchitis. The other two worms, if in small numbers just cause patches of chronic pneumonia, and the animal is merely weakened and made more susceptible to other infections. If in larger number, they may cause an acute pneumonia, which may easily kill the animal. If it recovers from this, it is very liable to be weakly all the rest of its life.

Treatment is difficult, for it is not easy to get medicines into contact with the worms. Intratracheal injections (of various oily antiseptic preparations in small quantities) may kill some of the bronchial worms, but nothing will actually reach those that are in the lung tissue. Far more important than this is to build up the animal's powers of resistance by careful nursing and tonics, and by dosing with copper sulphate to get rid of intestinal forms, thus leaving the animal more strength to overcome the worms in the lungs. Where *Protostrongylus* and *Muellerius* are present, measures can be taken to control snails, as mentioned under liver-fluke disease. Control of *Dictyocaulus* is mainly by rotation of pastures and keeping the flocks away from damp and marshy places, but as remarked before, this is hardly ever practicable in Cyprus.

External Parasites.—There are various external parasites affecting sheep and goats. They do less harm than the internal parasites previously mentioned, and are more easily controlled. Owing to their visible nature, an owner can see for himself how many there are, and in consequence they are dealt with more promptly than the internal parasites, which are frequently ignored until the animals start to die in consequence.

There are two kinds of lice, a brownish white biting-louse, *Trichodectes* which feeds on scurf and hair, and a bluish sucking-louse, which pierces the skin with a long proboscis, and sucks blood. The loss of blood is seldom enough to affect the animal in any way, and the chief harm done by lice is the constant irritation they cause, so that the animal is restless and scratches, when it ought to be feeding peacefully or sleeping. The ked, *Melophagus*, (a wingless relative of the common camel-fly, *Hippobosca*, which is such a pest to horses and dogs in Cyprus), occurs quite frequently on goats, but does no more harm than the lice. The most serious of the external parasites of sheep and goats are the ticks, of which there are several different kinds in Cyprus. These in addition to the amount

of blood they suck constitute a potential danger, for if any of the tick-borne diseases were accidentally introduced into the Island, the ticks would spread them, and serious losses would be caused. Another parasite which affects the goat, although rare, is the Follicle-mite, *Demodex*, which causes a form of mange with nodules in the skin, full of cheesy material. Mention may also be made in passing, of the sheep-scab mite, which fortunately does not occur in Cyprus. Sheep-scab is a very serious disease. The irritation it causes is intense and the affected sheep rubs its back and sides against trees, posts, etc., until nearly all the wool is torn off. The animals become very thin and weak. It is very contagious and spreads rapidly through the flocks.

The remedy for all these conditions is by dipping the animals in a specially prepared dipping mixture. This mixture at present is provided by the Veterinary Service free of charge to the Mukhtars of all the villages where there are dipping tanks. Animals that are kept free of external parasites keep healthier, and grow faster than those that are affected. There is also a considerable improvement in the quality and quantity of the wool in sheep that are dipped regularly.

NOSTRIL-FLY (*Oestrus ovis*).—This fly causes great loss of condition among the sheep of Cyprus during the summer months. The female fly hovers over the sheep and darts down suddenly to produce a living maggot, which is deposited in or near the nostril. This crawls up the nostril, and grows to its full size in from eight to ten months in the upper air passages, or in the cavities of the skull. When it is fully grown, it migrates down the nose again and is sneezed out. It then buries itself in the earth, and turns to a pupa. This hatches into the adult fly in from two to six weeks.

When the maggots have settled down in the upper part of the nasal passages they do comparatively little harm (unless they accidentally penetrate into the brain), but in their journeys up and down they cause great irritation, and this leads to a thick nasal discharge, and difficulty in breathing. The most serious trouble caused by this insect is when the adult fly attacks the sheep. The sheep are terrified by the fly, and stand huddled together in groups, hiding their noses against each other, or rubbing them in the ground. Sometimes they stamp about and wave their heads in the air. This continues all day long, and the sheep are unable to graze, and, therefore, become underfed and weak, and lose condition greatly. Goats are affected in the same way as sheep, but less severely.

The trouble can be overcome to a great extent by painting the nose just above the nostrils with a mixture of equal parts waste engine oil and tar. This repels the fly, and leaves the sheep to graze undisturbed by their attacks. The treatment should be repeated every two days from the time the flies appear until the end of April, and then daily dressings are necessary (owing to the prevalence of dust) until the end of the summer.

Warbles.—Warbles are swellings under the skin of the back, caused by the maggots of the warble-fly. Sheep are not usually affected, but goats in Cyprus are frequently attacked by the species *Hypoderma aeratum*. The details of the method of attack, and the life-history of this particular species of warble-fly have not yet been closely studied, but it is probable that they closely resemble those of the ox-warbles which are as follows: The fly lays its eggs not on the back, where the swellings appear, but in

some other part of the body usually on the legs. These hatch, and the young maggots penetrate the skin, and wander through the tissues until they reach the back. Here they settle down and grow to their full size, and cause swellings, which when fully formed have a small round hole in the middle, through which the maggot breathes. When it is fully grown, it crawls out through this hole, and falls to the ground, where it buries itself and pupates in the soil.

Warbles do not damage the health of the animal in any way, but the holes made greatly reduce the value of the hide, and thus cause considerable losses to flock-owners every year.

The maggots can be removed by hand, or by scrubbing the affected part of the back with a mixture containing Derris. When they are squeezed out, care should be taken not to burst the maggot. The whole swelling should be taken up between the thumb and one or two fingers, and gentle pressure exerted from below. The maggot will then slowly appear through the opening, and when once its widest part is through it will come out rapidly. Care should be taken to destroy immediately all maggots so removed, or they will bury themselves in the ground, and give rise to fresh flies in the summer.

This pest could easily be eradicated from the Island, if every owner would assist. The adult fly is seldom seen, except at the actual moment of attack, and no measures can be taken against it. But the maggot is very vulnerable. If every shepherd in the Island would examine the back of each of his goats two or three times during the winter, and squeeze out any warbles he found, Goat-warbles would no longer exist in Cyprus.

Myiasis.—Myiasis is the infection of wounds with maggots of various kinds of flies. In some countries there are flies which lay their eggs on unbroken skin, and the maggots make their own wounds. Fortunately in Cyprus, this does not occur, and it is only in wounds that are already present that myiasis is found. It can, therefore, be prevented by keeping all wounds clean, and dressing them with fly-repellent drugs, such as oil containing a little carbolic and eucalyptus.

When wounds are infected with maggots, the maggots are best killed before removal, otherwise they will dig down deeper when one tries to take hold of them, and may get hidden away out of reach. A suitable method of removing maggots is by killing them with a little chloroform, either on a pad of cotton wool, or else poured into the wound. The maggots are rapidly killed, and can be removed with forceps. When they are removed, the wound will heal quickly. This treatment is only suitable for myiasis on a small scale, but widespread myiasis is not usually found in Cyprus.

Pentastomes.—The Pentastomes are degenerate relatives of the ticks and mites, and are rather similar in appearance to tapeworms. They live in the nasal cavities of dogs, but the larval stages are found in the mesenteric glands of sheep, goats, and other herbivorous animals. They are not usually found in sufficient numbers to do any harm, but they are sometimes so numerous as to destroy the gland almost entirely. There is no treatment for the condition. The dog, which spreads the disease, becomes infected by eating diseased glands. It can, therefore, be controlled by proper disposal of carcasses and destruction of all infected slaughter-house offal.

[To be continued in June issue.]

Vine Experiment Station, Saitta.

OBSERVATIONS ON FOUR YEARS' EXPERIMENTS WITH LOCAL VINE VARIETIES.

THE varieties under discussion are the three well-known local varieties :—

- (A) Local Red or Mavron.
- (B) Local White or Xynisteri.
- (c) Local colour variety, Maratheftiko.

(A) LOCAL RED, MAVRON.

About 99% of Cyprus vineyards are planted with this variety, and trials are being carried out to find if yields can be improved by more suitable methods of pruning and cultivation. The following two treatments are being compared :—

(a) The normal methods, as carried out by the Cyprus farmer. This consists of one cultivation, with the Cyprus wooden plough, carried out at the same time as pruning in February—March, followed by a second cultivation. The method of pruning consists of cutting back all the shoots and leaving only one eye at the base. Three dustings with sulphur against Oidium disease are carried out at intervals before the vintage.

(b) A recommended method. A cultivation is carried out before the winter, and a second cultivation is given after pruning. Short pruning to the shape of a small tree with 3-4 arms, on each of which a bearer is left with 2 eyes, is adopted. Three sulphur dustings are given as in treatment (1).

From observations made during the four years of trial, the following results are shown :—

- (1) The treatments show no difference in the time of shooting flowering or ripening.
- (2) There is a slight difference, in favour of (b), in growth rate (shown by weight of wood).
- (3) There is large difference (about 33%) in favour of the recommended system in the yield of fruit. This difference can be regarded as significant.

Up to the present, therefore, the recommended system is shown to be superior to the normal methods practised in Cyprus.

(B) LOCAL WHITE, XYNISTERI.

This variety is found all over the Island and is treated in the same way as the local red. A trial is being carried out to demonstrate the value of "long" pruning for this variety. The treatments are the same as in (A), except that in the recommended system the vines are pruned to a small tree with bearer containing 4 eyes instead of 2.

After four years the following results have been shown. The recommended method leads to :—

- (1) An appreciable increase in growth (weight of wood).
- (2) A greatly increased yield of fruit, this increase being over 300% at both spacings under trial (6' × 6' and 8' × 8').

It is apparent, therefore, that variety Xynisteri should be given rather long pruning and that the Cyprus system of cultivation is unsuitable.

(c) **MARATHEFTIKO.**

This variety used to be cultivated among other varieties on account of its property of giving more colour to the wine. It was abandoned, little by little, by the growers on account of its unsatisfactory yield.

The low yield was attributed to improper pruning and a trial is being carried out in which three methods of pruning are compared :—

(a) Cyprus system.

(b) Short pruning (bearers with 2 eyes).

(c) Long pruning (bearers with 4–6 eyes).

Up to the present the yields from the experiment tend to show that long pruning is most suitable for variety Maratheftiko, although a higher yield of wood is obtained from the short pruned plots. At a spacing of 6' x 6', the long pruned plots yield over double the amount of fruit as the Cyprus system.

The Maratheftiko variety is also subject to unsatisfactory setting of flowers. An experiment was carried out to see if topping of the shoots before flowering would result in increased setting of fruit and, thus, an increased yield. The trial was carried out on each of the above systems of pruning and in each case yields were doubled by topping.

The results of the two experiments above show that if the Maratheftiko variety is pruned fairly long and the shoots are topped just before flowering a large increase in yield may be expected.

Fodder Conservation in Cyprus.

By J. P. MAULE, M.A., *Manager of the Government Stock Farm.*

THE following note is based on an article appearing in the *Agricultural Gazette of New South Wales* in September and October, 1936.

The recent shortage of grazing throughout the Island has again emphasized the need for some attempt to be made at growing and conserving fodder crops to provide feed for stock particularly during such periods of scarcity but also during the early part of the winter when grazing is generally poor and conditions unfavourable.

In most areas in Cyprus natural grazing is always limited and hence the stock owner or shepherd who can provide a regular supply of rovi and rovi or vetch straw and later can obtain early green barley is almost always assured of increased milk production in his flock and the prevention of sickness and death among his stock. But in addition to vetch or other straw which may not always be plentiful there are other and better crops which can be grown for the definite purpose of providing food during the winter or whenever grazing is scarce. These can be divided into two categories : (1) Hay ; (2) Silage.

(1) Hay can be made from almost any cereal or leguminous crops but preferably from the following :—

(a) Lucerne.

(d) Rovi, Favetta or Vetches.

(b) Oats.

(e) Barley.

(c) Oats and Vetches.

Lucerne hay is made during the summer when the crop is just coming into flower. It has to be very carefully handled to be made into good hay. It should not be allowed to lie out in the sun when cut until quite dry but should if possible be carried under an open shed or verandah where it can dry gradually ; if over dry the leaves become brittle and fall off thus depriving the hay of its most nutritious part.

Oats and vetches or barley should all be sown early and should be cut when coming into flower. If irrigated they should be ready for cutting by March. The crop must be allowed to dry out before being stacked and owing to the nature of the stems (they are hollow) this takes longer than is usual in making hay from grasses.

When vetches are included the crop should be cut before they are ripe as otherwise the value of the hay is very much less. When cut and dried in the field the crop should be taken and stored under cover. A shed with three open sides is very suitable for this purpose.

Rovi, vetches or favetta are usually grown for seed but could also be grown for hay and cut while in flower as in the case of lucerne.

(2) Silage is considered a more economical, easier and safer method of conserving fodder than hay making especially if the weather is not perfectly dry. Moreover being a succulent form of fodder it is very suitable for dry periods. Good silage is not difficult to make and has been made with success at the Government Stock Farm and at the Farm of the Cyprus Farming Company at Kouklia for the past two years.

It can be made from most crops but preferably from :—

- (a) Maize,
- (b) Oats, Vetches and Beans mixed.
- (c) Lucerne or Lucerne and Oats or Barley.
- (d) Cotton leaves.
- (e) Ordinary grass if sufficiently long to be cut.

It is, however, important to note that good silage cannot be made from over-ripe or over-dry crops nor from very wet or immature crops.

There are different methods of making silage, *i.e.* in a tower, stack, pit or trench, but of these the two latter are preferable in Cyprus and the latter is probably the least expensive. A long trench, 3–4 feet deep should be dug on high ground not liable to flooding; the trench could be 20–25 feet long and 7 feet wide; the sides should be slightly sloping so that the trench is narrower at the bottom than the top.

The pit silo must be dug out of the ground to a depth of 12–15 feet and unless the ground is very hard it is preferable to line it with stone. It should be built up about 4 feet above ground level and should be from 10–12 feet wide. The crop must be put into the trench or pit immediately it is cut and the trench or pit filled as quickly as possible. It should be built up above ground and then completely covered over with a thick layer of earth and stones to settle. It can be opened after about 4–5 months or longer if desired. The crop can be ensiled without cutting it up or it can be cut or chaffed up before being filled into the pit or trench.

These few notes give some idea of the ways of making both hay and silage and they show that it is neither difficult nor expensive way of conserving fodder. At Athalassa hay, both lucerne and oats and vetches, and silage including maize and oats, vetches and beans mixed, have proved of inestimable value during the past four months.

The new crops are growing well and hay-making will be begun again at the end of March or in April and the two silage pits made in 1935 and 1936, will also be filled.

Thus provision for next winter will be assured and farmers in Cyprus would be well advised to do likewise before it is too late, to provide some extra fodder for their stock, either in case of drought and lack of grazing next winter or to supplement the naturally poor grazing available in the Island for practically nine months of the year.

Agricultural Science fights Adverse Weather Conditions.

CITRUS growers in Cyprus, having in mind that their own groves are sometimes assailed by abnormally cold weather during the early months of the year, when considerable damage is done both to the fruit on the trees and (in the case of late frosts) to the blossoms of the new crop, may be interested in the following account of measures taken by California citrus growers to safeguard their valuable crops of oranges, lemons and grapefruit.

During January of this year, the wireless, meteorology, physics, chemistry and traffic control were all called in in the case of Agriculture, and a campaign costing, it is estimated about £200,000 was launched in an effort to save the citrus crop in California valued at £100,000,000 from the effects of frost.

The citrus growers, through their co-operative associations, fought the frost by changing the weather, viz. by raising the temperature by means of orchard heaters (or "smudge pots" as they are known locally). It is estimated that some 5,000,000 were in use, 95 % of which were burning oil. The fires warm the air in the orchards, and the dense smoke that they throw out prevents radiation. When there is no wind, the smoke clouds spread out like a pall in all directions and are effective in keeping the temperature up throughout the night.

The Government Meteorologist, stationed in the heart of the citrus belt, 30 miles east of Los Angeles, warned the citrus growers by wireless several days in advance of the frost, to lay in supplies of oil. So accurate was the frost prediction that the growers were told, in each area, the precise time at which to begin and end orchard heating.

The orchard heater of the latest design used by the majority of growers is a vessel about three feet in diameter and a foot high, with pipes four or five feet high extending upward, throwing the heat aloft and outward to the trees, which are very much more widely spaced than in Cyprus, being on an average about 25 feet apart.

These orchard heaters were laid out in the groves during the autumn, and will not be taken up again until the late spring. Heating must begin whenever the temperature reaches 28 degrees (F.) which even in a normal winter in California occurs on 2 or 3 nights.

At times of intensive "smudging", as at the present period, the growers' supplies of oil are quickly depleted and the quick transportation of fuel throughout the whole citrus belt is vital to the protection of the crop. Movement of the oil by lorries and tank-cars is supervised by the growers' co-operative associations (not by the Government) which see that each orchard is adequately supplied.

Oil lorries crowding the roads, but covering carefully planned routes, penetrated to all areas where there was any danger from frost. These vehicles received right-of-way over all other traffic, and it is estimated that a total of 30,000,000 gallons of oil were used. Movement of the lorries was a special problem for the authorities, for the smoke from the heaters hung thickly over the roads, and ordinary traffic could move only slowly through it.

These modern means of protecting oranges, lemons and grapefruit has been gradually perfected by the growers since the first attempts to save their products from frost about 1870.

In California a severe frost is experienced only about every ten or fifteen years, but when it comes, it calls for a life and death struggle to

protect the crop. It is noteworthy that each peak-period of severe frost, of which the present exceptionally cold weather is an example, sees a reduced rate of loss due to these methods of control which have been developed through the years.

Preliminary Trial of Disinfection of Seed Potatoes to control Scab.

By R. M. NATTRASS, *Plant Pathologist.*

THE Common Scab, *Actinomyces scabies* (Thaxt.) Güss., does not appear to be normally present in Cyprus soils. Within recent years, however, it has been introduced to a certain extent on imported seed potatoes and occasionally appears on the tubers of the spring crop.

Extensive experiments have been undertaken, during the last few years, in Northern Ireland on the treatment of scabbed tubers with organic mercury compounds for the control of scab. In co-operation with the Botanical Department of Queen University, Belfast, a preliminary trial was carried out in 1936, to test the efficacy of treating seed potatoes in Ireland for planting in Cyprus. It was thought that the treatment might also have the effect of checking wastage of tubers during transit.

The seed received from Ireland consisted of the following lots :—

- A.—Good Commercial Seed of Up-to-Date—not disinfected.
- B.—Good Commercial Seed of Up-to-Date—disinfected,
- C.—Up-to-Date severely affected with Scab—not disinfected.
- D.—Up-to-Date severely affected with Scab—disinfected.

On arrival in Cyprus the disinfected seed was slightly moist and showed about 50 % more wastage than the untreated. The moist condition of the tubers was due to the difficulties involved, owing to weather conditions in Ireland, at the time of treatment and dispatch.

The scabbed seed showed a slightly higher proportion of wastage than the good commercial seed. It is clear that, unless special precautions are taken to dry the seed after treatment, the disinfectant does not reduce wastage in transit.

The seed was planted at the Central Experiment Farm on land which had not previously borne a crop of potatoes.

The crop was lifted on July 6th, the amounts of scabbed and healthy tubers are given below :—

	<i>Healthy tubers. Scabbed tubers. Scabbed tubers</i>		
		%	%
A.—1 bag Commercial stock seed of "Up-to-Date" not disinfected	236 lb.	22.2 lb.	8.6
B.—1 bag Commercial stock seed of "Up-to-Date" disinfected ..	300 lb.	2 tubers	0.0
C.—1 bag severely attacked by Common Scab—"Up-to-Date" non-disinfected	178 lb.	44 lb.	19.8
D.—1 bag severely attacked by Common Scab—"Up-to-Date" disinfected	190 lb.	1.5 lb.	0.78

The effect of the treatment was considerably to reduce the amount of Scab on the crop from severely attacked tubers. On ordinary good commercial seed which normally is always slightly affected with scab a practically complete control was obtained.

Further extensive trials are now in progress to compare the effects of treating seed before shipment and on arrival in Cyprus.

EDITORIAL AND ADVERTISEMENT NOTICES

All communications for publication should be addressed to the Editor, *Cyprus Agricultural Journal*, Department of Agriculture, Nicosia.

Contributions are invited, written on one side of the paper only. It should be understood that unaccepted manuscripts can not be returned unless postage is prepaid.

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The "*Cyprus Agricultural Journal*" is published in March, June, September and December.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

The Horse Breeding Law, 1930.

LIST OF STALLIONS LICENSED FOR 1937.

NICOSIA DISTRICT.

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Akaki	..	Michael Th. Rafti	..	29
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Elea	..	Rejeb Ahmed	..	254
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Kato Kopia	..	Yeoryios Haji Haralambou	..	271
Lefka	..	Yiangos G. Boyiadji	..	20
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20th March, 1937.

ROBERT J. ROE,
Chief Veterinary Officer,
Inspector of Horse Breeding.

Meteorological Data, Cyprus.**SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS.
DECEMBER, 1936.**

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	58.55	42.35	4.57	12	1.66	2.39	—
Athalassa	—	—	4.22	8	1.59	2.31	—
Morphou	—	—	4.79	10	1.80	2.02	—
Makharas	—	—	17.00	9	3.80	4.52	—
<i>Famagusta District :</i>							
Famagusta	63.35	47.48	6.48	11	1.80	3.26	—
Akhyritou	60.20	43.90	5.45	10	1.63	2.57	—
Rizokarpaso	—	—	7.82	7	3.35	4.40	—
Lefkoniko	—	—	3.98	10	1.10	2.87	—
<i>Larnaca District :</i>							
Larnaca	60.00	43.00	7.39	9	2.06	4.92	—
Lefkara	—	—	11.64	10	3.20	5.16	—
<i>Limassol District :</i>							
Limassol	61.94	46.71	7.61	12	1.42	3.75	—
Saittas	—	—	15.85	9	7.03	5.18	—
Trikoukkia	45.00	32.40	21.20	12	8.50	6.80	—
Alekhtora	—	—	11.71	10	3.50	4.76	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	4.27	—
Polis... ..	—	—	8.78	9	4.50	3.59	—
<i>Kyrenia District :</i>							
Kyrenia	60.30	49.30	6.12	14	1.88	4.60	—

JANUARY, 1937.

<i>Nicosia District :</i>							
Nicosia	54.03	38.35	5.78	16	2.00	3.75	—
Athalassa	—	—	5.35	13	1.89	3.47	—
Morphou	58.80	39.00	4.81	14	1.10	3.11	—
Makharas	—	—	7.40	4	3.00	5.75	—
<i>Famagusta District :</i>							
Famagusta	57.32	40.55	5.33	12	1.85	4.42	—
Akhyritou	55.40	38.00	4.11	13	1.30	3.11	—
Rizokarpaso	—	—	10.09	12	2.20	6.19	—
Lefkoniko	—	—	3.67	11	1.85	3.37	—
<i>Larnaca District :</i>							
Larnaca	55.00	39.00	4.96	11	1.50	5.33	—
Lefkara	—	—	8.66	10	1.60	4.84	—
<i>Limassol District :</i>							
Limassol	57.39	42.00	5.25	15	1.52	4.07	—
Saittas	—	—	9.22	16	1.70	5.88	—
Trikoukkia	40.70	27.30	15.25	18	1.60	6.74	—
Alekhtora	—	—	9.24	14	2.45	4.57	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	3.80	—
Polis... ..	—	—	3.46	10	0.52	3.26	—
<i>Kyrenia District :</i>							
Kyrenia	56.18	42.70	11.41	17	2.41	5.53	—

Note.—Compiled from returns furnished by Public Works Department.

FEBRUARY, 1937.

District and Station	Shade temperature			Rainfall				Dates on which snow fell
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years	inches	
	Maxim.	Minim.						
<i>Nicosia District :</i>								
Nicosia	62.57	43.50	0.61	4	0.31	0.19		
Athalassa	—	—	0.75	2	0.62	0.17		—
Morphou	63.75	—	0.64	4	0.41	0.07		
Makheras	—	—	—	—	—	0.42		
<i>Famagusta District :</i>								
Famagusta	66.00	44.89	0.72	4	0.30	0.22		—
Akhyritou	63.30	42.20	0.41	3	0.19	0.20		
Rizokarpaso	—	—	2.52	6	0.70	0.07		
Lefkoniko	—	—	1.61	6	0.71	0.30		—
<i>Larnaca District :</i>								
Larnaca	60.00	43.00	0.48	3	0.19	0.04		
Lefkara	—	—	2.29	7	1.05	0.23		
<i>Limassol District :</i>								
Limassol	64.82	46.25	0.93	5	0.32	0.09		—
Saittas	—	—	2.42	6	1.53	0.76		
Trikoukkia	47.10	34.00	3.35	8	0.75	0.37		—
Alekhtora	—	—	1.31	5	0.60	0.07		
<i>Paphos District :</i>								
Paphos	—	—	—	—	—	0.05		—
Polis	—	—	0.35	3	0.18	0.02		—
<i>Kyrenia District :</i>								
Kyrenia	63.11	47.26	0.25	4	0.10	0.06		—

Note.—Compiled from returns furnished by Public Works Department.

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Manager, Stock Farm, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Famagusta, Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Limassol, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Officer in Charge of the Farm.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, including the Nursery Garden, Nicosia, and Officers are stationed at Kythrea, Dheftera and Morphou.

Lefka Sub-District.—Agricultural Officer, Ibrahim Hakki Effendi, is in charge, including Pyrgos area.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA AND LIMASSOL DISTRICTS.

Agricultural Officer, Mr. M. Papaïacovou, is in charge, including Larnaca Nursery Garden. Officers are stationed at Larnaca, Skarinou, Nisou, Agros and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Kyprianides, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klokkaris, is in charge. Paphos District includes Paphos and Polis Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelo-kedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant,

**Table Showing Distribution of Stud Animals at the Stud
Stables and Government Stock Farm, Athalassa
on 1st April, 1937.**

<i>Station</i>	<i>Stallion</i>	<i>Donkey</i>	<i>Bull</i>	<i>Breed of Bull</i>
—	—	—	—	—
Athalassa	Waterkoscie	No. 42	Minstrel	Shorthorn
	Kildare Guard	No. 38	Monarch	Kerry
		No. 55	No. 469	Cyprus
Ay. Theodoros Pitchford		No. 50	No. 461	Cyprus
Famagusta	Friars Flutter	No. 51	No. 443	Cyprus
Larnaca	Moleskin	No. 52	No. 462	Cross-bred
Lefkoniko	Marcher Lord	No. 48	No. 468	Cyprus
Morphou	—	No. 47	—	—
Nicosia	—	—	Ambassador	Shorthorn
Paphos	—	No. 41	No. 454	Kerry
			No. 436	Cyprus
Polis	Sonny Boy	No. 49	No. 451	Kerry
Rizokarpaso	—	No. 54	No. 460	Cyprus
Vatili	Corby Bridge	No. 56	No. 458	Cyprus

Notes : 1.—There are Boars at all the above stations except Vatili, Nicosia and Morphou and he-goats at all stations except Morphou ; there is a pen of R.I.R. poultry at Larnaca, Famagusta, Vatili, Lefkoniko and Ayios Theodoros Stud Stables.

2.—Boars and he-goats may be issued on loan to *bona fide* applicants upon application to the Director of Agriculture or Manager, Stock Farm, Athalassa.

Bovril, Limited.

A SATISFACTORY YEAR.

PRESIDING at the Fortieth Annual General Meeting of Bovril, Ltd., held in London on 25th February, 1937, the Lord Luke, K.B.E. (Chairman), said it was with pleasure that they met again and were able to present the Shareholders with such a satisfactory report and set of accounts.

DIVIDEND NEVER MISSED.

It was over forty years since this company was formed, and not only had they always met the dividends on the Preference and Ordinary shares, but they had never missed paying a dividend on the Deferred shares.

SIR JAMES CRICHTON-BROWNE ON INFLUENZA.

Sir James Crichton-Browne, M.D., LL.D., F.R.S., spoke on the useful part Bovril had played in connection with the epidemic of influenza which had recently visited the country. The epidemic, although said to have been of a mild character, left a trail of debility behind it.

There was no known cure for influenza, and the only effectual way of dealing with it was to resist its invasion and to keep it at bay by the antagonism of a well-nourished body and a calm and defiant mind. It was, Sir James said, by its power of augmenting this vital antagonism that Bovril was so helpful not only against influenza, but against other maladies. Bovril contributed to the national fitness of which we had heard so much of late. It was itself a body-builder and he might say that recent researches had proved incontestably by experiments, not on rats, but on human beings, that Bovril had an altogether singular power of increasing the gastric secretions and so a stimulating digestion and promoting assimilation and nutrition generally.

BOVRIL AND NATIONAL FITNESS.

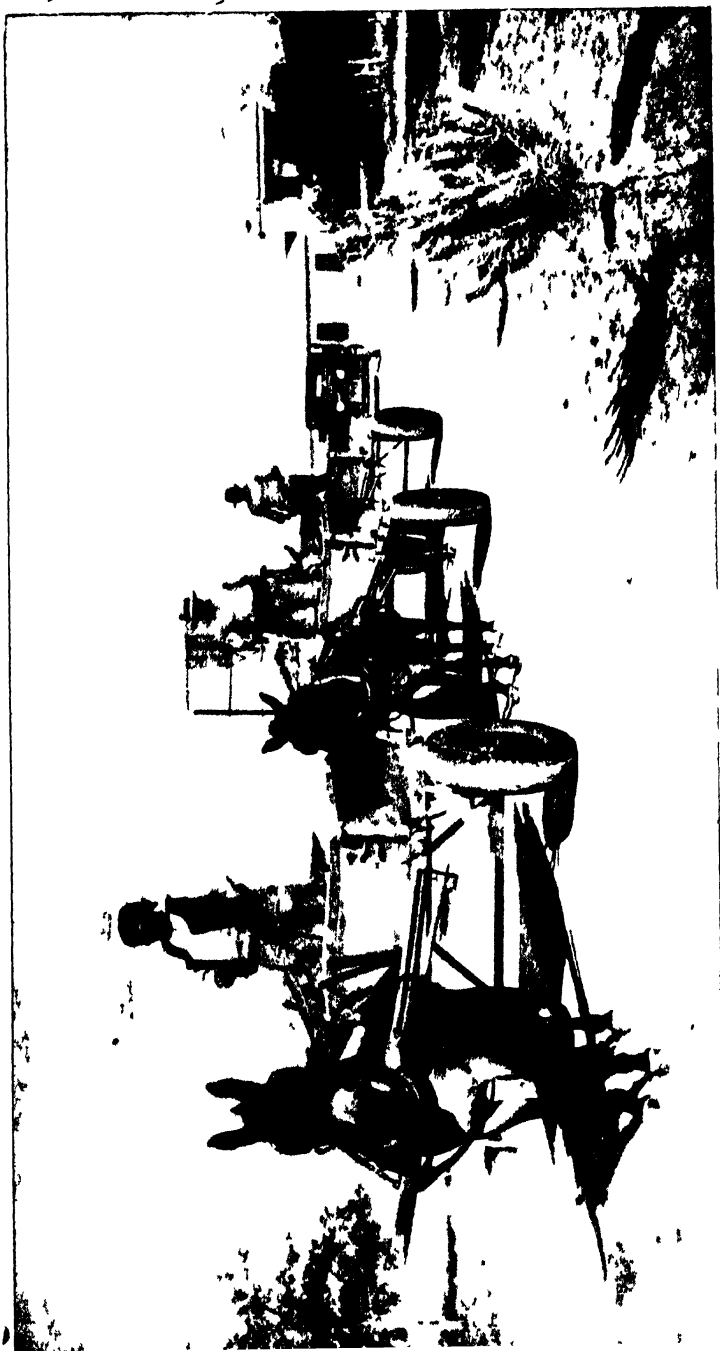
Commenting on the national fitness campaign, Sir James welcomed the enlightened views expressed by Mr. Oliver Stanley when he cautioned the country against regarding physical training as the one criterion of national fitness. Not only were physical exercises and recreation no substitute for nutrition; they were quite secondary and subordinate to it.

The greatest living authority on nutrition, Sir Gowland Hopkins, the discoverer of the vitamins, had said that nutrition came before housing, and he was sure Sir Gowland would say it came before physical exercises. These, if imposed on the under-nourished, would do more harm than good. Nutrition was the basic condition of good health and bodily fitness.

In proposing the re-election of the Duke of Atholl, Sir James said the Duke was the only man in the kingdom who was entitled to raise an army of his own and once a year, Sir James believed, he did muster his retainers. Bovril had not yet required his military assistance, but he was in possession of other forces—his sagacity and knowledge of affairs which were freely given to its support.

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Carts at the Central Experimental Farm, Morphou, fitted with Dunlop Pneumatic Equipment
for Animal Drawn Vehicles.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW
OF THE
AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

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EDITORIAL NOTES

CEREAL CROPS received a setback owing to the failure of the March rains, but the cool weather and heavy dews averted any disaster to the crops.

Good rains followed in April but their beneficial effect on cereals was negligible as maturity was too advanced and in some districts harvesting was actually in progress.

The prospects for olives, almonds and carobs are good. Fruit setting of citrus is fairly good although high winds were unfavourable. Considerable damage was done to vines by hail at Vasa. The cherry crop was average and production of apricots is good.

* * * * *

RURAL EXTENSION EDUCATION.

Mr. John Christodoulou, Agricultural Assistant, Mr. Omiros Loizides, Agricultural Assistant, and Mr. Socrates Coudounaris, Sanitary Inspector, were selected for a month's observation and study tour of the Macedonian project of the Near East Foundation.

These officers left Cyprus on the 19th March, 1937, for Piræus and returned to Cyprus on the 16th April. Mr. H. B. Allan, the Director of the Near East Foundation, Salonica, Greece, arranged an excellent programme of observation for a tour of the Macedonian Village Extension Scheme. The officers concerned gained a considerable amount of useful information which should be helpful when the Cyprus scheme is inaugurated after Mr. Weston's return from America in about September next.

* * * * *

COTTON LEGISLATION.

A Law to regulate and control the cultivation of cotton and the cotton industry cited as the Cotton Law, 1937, was published recently for general information as a draft Bill and will shortly be submitted for enactment.

The objects and reasons of this Bill are stated to be to regulate and control the cultivation of cotton and the cotton industry by measures.—

- (a) to ensure that the type of cotton seed used is of an unmixed variety.
- (b) to enable mass improvement of cotton.
- (c) to secure that ginning shall so far as possible be properly carried out.

CYPRUS SHIPPERS' ASSOCIATION.

The Second Ordinary General Meeting of the Members of the Cyprus Shippers' Association was held at Nicosia on the 5th April, 1937. Two new members were elected to the Council, namely Mr. E. Disney and Mr. G. G. Schiza.

A meeting of the Council was held on the 5th May, 1937, when it was agreed to form Committees that will collaborate with the Council for the improvement of the export trade of potatoes and wines.

The members of the Council met the potato exporters at Larnaca on Wednesday, 19th May, and the Wine Exporters at Limassol on Wednesday, 26th May, when the question of the formation of Committees for considering steps to be taken for the improvement of the export of these commodities was discussed.

Such Committees were formed composed of 5 members each and these Committees agreed to submit proposals to the Council in due course.

* * * * *

COMMITTEE TO REPORT ON THE CITRUS INDUSTRY.

Government has appointed a Committee to report on problems connected with the Citrus Industry.

This Committee will enquire into, report on and make recommendations with reference to :—

- (a) The desirability and practicability of the co-operative marketing for export of all citrus fruit through one channel by means of a marketing board or otherwise.
- (b) Any other matter in connection with the Citrus Industry which the Committee deems it advisable to investigate.

The members of the Committee are :—

The Director of Agriculture (*Chairman*).

The Registrar, Co-operative Credit Societies (*Vice-Chairman*).

Mr. N. P. Lanitis, Limassol.

Dr. M. Finzi, Kouklia, Famagusta District.

The Chief Grader and Inspector of Produce.

* * * * *

AGRICULTURAL SHOWS.

The village authorities of Peristerona-Piyi held their annual animal show at the village on the 6th June, 1937. Although the number of entries was not so high as on previous occasions the quality of the livestock showed a considerable improvement over the standard of animals exhibited on previous occasions. Credit is due to Mr. Loizos S. Hajikakou, Mr. Michael G. Michael and Halil Sadik, Mukhtars of Peristerona-Piyi, for their efforts to make the Show a success.

Forthcoming Agricultural Shows are :—

Akhna Potato Show—July.

Agros Agricultural Show—September.

Athienou Agricultural Show—October.

Stroumbi (Paphos District) Agricultural & Animal Show—October.

Proposals are under consideration to hold shows at Morphou, Platres and Lysi.

SCHOOL GARDENS.

The prizes for school gardens for the year 1936-37 have been awarded. It was decided to classify the gardens into 6 classes on the basis of marks given for various aspects of the work carried out during the year. School gardens scoring less than 70% were not considered eligible for a prize. Under the system of marking all school gardens, small or big, irrigated or unirrigated and with a large or small number of pupils had an equal chance for a prize.

During the school year 1936-37, 115 school gardens were eligible for prizes. Of these, 63 are in class 6 receiving 10s. each, 19 in class 5 with 15s., 13 in class 4 with £1, 6 in class 3 with 25s., 10 in class 2 with 30s. and 4 in class 1 with £2. In addition, the Colony prize of £3 was awarded to the best garden in class 1. This time the Colony prize was awarded to Yialousa school garden, but Anoyira and Agros both had very good gardens and came very close to the winner.

The standard of school gardens is improving year by year and many gardens are proving useful assets to their villages.

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LIVESTOCK NOTES.

All the livestock imported last October are progressing favourably. It is proposed next year to offer prizes for the best offspring of the Irish draft stallion "Kildare Guard."

The Dale Pony is being travelled between Paphos and Polis stud-stables every month.

Of the 4 Dairy Shorthorn heifers, one is giving nearly 5 gallons (20 okes) per day and 2 others have given nearly 3 gallons (12 okes) per day.

The Dairy Shorthorn bull "Minstrel" has been exchanged with "Ambassador" and is now stationed at the Agricultural Department in Nicosia.

The crossbred cow No. 321, whose records were given in this Journal in March, 1936, has now completed her 4th lactation and has given 13,343 lbs. of milk (4,765 okes) in 338 days, which is equivalent to an average of nearly 40 lbs. or 14 okes per day. This total yield is probably the highest ever recorded in Cyprus.

There are 3 stallions now on loan in the Island at Kato Dhikomo, Limassol and Evdhimou and it is hoped to place a 4th, previously on loan at Nisou, elsewhere very shortly.

* * * * *

ARBOR DAY.

The following planting material was issued or sold during the 1937 Arbor Day Celebrations :—

District	No. of plants issued to pupils			No. of plants sold		
	Fruit trees	Industrial seedlings	Forest seedlings	Fruit trees	Industrial seedlings	Forest seedlings
Nicosia ..	3,324	1,919	5,472	740	137	410
Larnaca ..	1,611	702	1,684	975	20	212
Limassol ..	3,652	675	738	1,195	—	—
Famagusta ..	3,847	2,074	12,755	977	58	641
Paphos ..	8,442	2,512	3,882	1,054	10	490
Kyrenia ..	1,160	445	2,430	247	450	173
Total ..	22,036	8,327	26,961	5,188	675	1,926

SERICULTURAL NOTES.

Production of Silk Cocoons.

The rearing of silkworms is now over for the season and the results obtained are satisfactory, no serious diseases having appeared during the rearing.

Fresh cocoons have appeared on the market and have been purchased by merchants at 14 to 17p. per oke, this price is considered by the producers as satisfactory and it is expected that a larger quantity of silkworm eggs will be disposed of for next year's rearing.

Owing to the favourable weather the quality of cocoons produced this year is very good.

The total production of cocoons in Cyprus this year is estimated at 105,000 okes approximately.

* * * * *

Demonstrational Silkworm Rearings in Girls' Schools.

Demonstrational silkworm rearings have been carried out in 106 Orthodox-Christian and 10 Moslem girls' schools a total of 116, in various villages of the Island. The rearings were as usual undertaken by the schoolmistresses and older school girls under the supervision of the Sericultural and Agricultural officers who visited the rearings several times and gave instructions and lectures on sericulture during the course of the rearing.

These rearings were visited by many of the village rearers who noted the improved methods of hatching and rearing of the worms.

The prizes awarded to the schoolmistresses, who were in charge of the best demonstrations, will be announced later.

* * * * *

CODLING MOTH (*Carpocapsa*).

Spraying of apple trees against this pest is being carried out on a larger scale this year than in any previous season, many apple growers having been interested owing to the very satisfactory results which have been obtained.

* * * * *

OLIVE FLY EXPERIMENTS.

The experiments which were commenced last year to compare various baits for the olive fly and to test the effect of spraying baits on to olive trees, have been resumed this season.

* * * * *

LOCUST CAMPAIGN.

The locust campaign during the past season was carried out on the usual lines, the first purchasing centre being opened on 22nd March and the last centre closing on 18th May. Centres were open at ten villages for various periods during that time.

The total quantity of locusts destroyed was 16,469 okes, compared with 24,746 okes last year, this considerable decrease being chiefly due to the much smaller occurrence of the Italian Locust (*Calliptamus italicus*), known as "Tsakrakrida." The Moroccan Locust (*Dociostaurus maroccanus*), the "true locust," was rather more abundant than in the previous year in the southern part of Famagusta District, but in most other areas was rather less abundant.

Soil Erosion in Cyprus.

A REPORT on Soil Erosion in Cyprus* by Mr. A. Pitcairn, Assistant Director of Agriculture, has been submitted to Government and this Report has been printed in English, Greek and Turkish and circulated throughout the Island. In view of the importance of the necessity to prevent abnormal soil erosion in the Island, Government has taken steps to bring to the notice of all persons concerned through the Administrative Officers, Mayors, Mukhtars and District Councils the vital importance of the erosion menace.

The contents of the Report are :—

Part I.—Introduction.

1. General introduction.
2. Types of erosion.

Part II.—The conditions which are allied to or conducive to erosion in Cyprus.

1. The various conditions—General.
2. The direct factors—The physical features, geological formation, soils and natural vegetation.
3. The factors subject to human activities—Forestry, Agriculture, Animal Husbandry, Viticulture, Mining and Road Making.
4. The administrative conditions.

Part III.—Historical data, main causes and present extent of erosion.

1. General historical data.
2. The main factors causing abnormal erosion.
3. Extent of erosion.

Part IV.—Present extent of erosion control.

1. The counter erosion measures practised in Cyprus.
2. Further counter erosion measures recommended.

Part V.—Summary of conclusions.

1. The measures necessary to prevent abnormal erosion in Cyprus.
2. The application of such measures in Cyprus.

The Report also contains as Appendices a rainfall map, a graph showing the sheep and goat census since the Occupation 1878–1936, and 10 full-page illustrations showing the effects of uncontrolled erosion and the beneficial results where adequate control measures have been taken.

Part I directs attention to the alarming nature of the subject and gives a brief definition of the various types of erosion.

Part II outlines the main features of the physical factors, the factors subject to human influences and the administrative conditions and indicates the relationship between these factors and the extent of erosion. In this part of the Report a brief yet adequate sketch of the climate, topography, geology, soils, natural vegetation, agriculture, forestry and land tenure is given.

Part III outlines the history of erosion from the first phase of the geological history of the Island up to the present time and attributes the greatest cause of abnormal erosion to grazing and fuel cutting. The

* *Bulletin No. 4*, Department of Agriculture, Cyprus. "Report on Soil Erosion," A. Pitcairn, Assistant Director of Agriculture.

question of grazing is dealt with in detail. The most important branch of animal husbandry in Cyprus is the breeding and management of sheep and goats for the production of dairy products, and an attempt has been made to determine the carrying capacity for grazing sheep and goats. The figure arrived at under existing conditions is 5 donums per animal.

The evils of goat grazing are stressed and the following section of the report on goats is quoted :—

“*Goats*.—Of the total number of goats it is estimated there are 82,700 in the plains and coastal areas and 183,700 in the hilly and mountainous areas.

One goat per donum is sufficient to clear any area of scrub growth when goats are allowed to graze uncontrolled and according to Hutchins (¹⁴) *Anagryis foetida* is the only plant in Cyprus which the goat refuses to eat. Under these circumstances combined with fuel cutting it is no wonder that the scrub forests and the forests of the northern range are disappearing rapidly.

The average gradient of the slopes in the mountains is fifty per cent. and the incessant trampling of goats on the steep rocky slopes on the forests is the cause of scree formation. (⁵) The practice of grazing goats in the vineyards on the steep slopes in winter is also an additional cause of erosion in the non-forest areas which might well be avoided. Furthermore the excessive trampling of goats on the steep slopes has drying effect on the soil and thus reduces the absorptive capacity of the soil.

As a contributory cause of soil erosion in the hilly areas, the goat ranks high and in spite of the Goats Law which was passed with a view to the reduction of the number of goats in Cyprus the total numbers of goats in 1936 are 31,095 more than at the time of the Occupation.

The importance of urgent action in reducing the number of goats in the hill areas is apparent on account of its relation from the forest and water conservation as well as from the soil erosion point of view.

Many of the eroded valleys in the southern range might be reclaimed for fruit growing or other agricultural purposes by constructing dams in the streams and gullies and it is possible in the course of time to eliminate some of the goat grazing by diverting the future generations of goat herds to other pursuits.

So far as goat grazing in the forests is concerned, this is a matter of forest policy. In the non-forest areas in the hills, the best solution would be to aim at guiding the village authorities to adjust the grazing in accordance with the best uses of the village lands.”

Special attention is directed to the unrestricted cutting of “*thrumbi*” (*Thymus capitata*) for village and town fuel supplies and the difficulties encountered in terracing vineyards are fully discussed.

Parts IV and V of the Report which mainly deal with the specific problems of erosion control in Cyprus are quoted hereunder in full :—

“PART IV.—PRESENT EXTENT OF EROSION CONTROL.

1. *The Counter Erosion Measures practised in Cyprus.*

The usual measures adopted in Cyprus to decrease the velocity of surface run off water are :—

- (a) The use of dry stone walls.
- (b) Terracing.
- (c) Strip cultivation.

- (d) Reclamation of valleys by training and damming streams.
- (e) Tree planting combined with cereal growing in the hills.
- (f) Irrigation with silt laden flood waters.

The dry stone wall method is the most general and effective counter erosion method employed and found in use in a number of different circumstances, the principal of which are :—

- (i) Gully prevention on the alluvial plains.
- (ii) Gully reclamation on the alluvial plains.
- (iii) Gully control on the slopes.
- (iv) The reclamation of valleys for cotton cultivation by collecting silt and retaining soil moisture.
- (v) The prevention of sheet erosion on cultivated slopes with a moderate gradient.
- (vi) The terracing of gullies and streams for afforestation.

The usual method in making a dry stone wall for gully control is to build the stone wall several feet into the solid ground on each side of the gully and fill up the back of the stone wall to the level of the top and sloping gradually backwards into the bottom of the gully. On the arable fields where there is any indication of any danger of gullying a low stone wall is placed across the low lying ground and natural vegetation such as wild thyme allowed to grow over the wall. The traces of countless numbers of such walls, which were put up hundreds of years ago are still found in all parts of the Island, and this method of counter erosion is traditional.

A large proportion of the land under cotton cultivation is found in the valleys which have been saved from erosion by the dry stone wall method.

In the unirrigated cereal combined with carob and olive growing cultivation on the lower slopes of the hills erosion is prevented by erecting a series of low dry stone walls around the contour.

The work done by the Forest Department in terracing gullies at the source of streams is described by Unwin in "Counter Erosion Methods in Cyprus with Dry Stone Walls." (6)

Terracing.—Terracing is invariably carried out where adequate supplies of suitable stone material are available to construct the terrace. As the slopes are steep, the level bench and sloping bench terraces are made. The steep slopes of the igneous formation are rarely terraced owing to the absence of suitable stone and insufficient growth of natural vegetation to form a bank except for crops of high donum value such as fruit trees. Olive and carob trees on untterraced steep slopes are protected by individual terraces for each tree.

Strip cultivation for cereals is practised on the steep untterraced slopes and the usual practice is to clear and cultivate a narrow strip and leave a strip of natural vegetation of equal width.

The reclamation of eroding valleys is done to a very limited extent in the valleys adjoining certain villages in the southern range and the Karpas. Dry stone walls or cement dams are used. Good examples of reclaimed valleys are found near Yialousa in the Karpas.

Counter erosion methods by forming broad terraces on the contour in the unirrigated cereal combined with carob and olive growing lands are usually found on the medium slopes in the carob and olive growing areas. Although the production of cereals is small, the crop provides a supply of fodder for the draught oxen and the cultivation is most beneficial to the carob and olive trees.

The greatest benefit derived from erosion in Cyprus is the traditional method of irrigating the arable land with silt laden flood water and except during storms of very intensive rain a very high percentage of the silt is distributed over the land by this method.

2. Further Counter Erosion Measures Recommended.

On the cultivated lands where there is an adequate supply of stone it is the practice to do all that is possible to control erosion and the neglected terraces or unrepaired stone walls in the gullies are usually found on the leased lands or lands owned by indebted peasants who have lost interest in their land.

Further measures which should be taken are :—

- (1) Protection of unterraced slopes where the underlying rock weathers rapidly.
- (2) Drainage.
- (3) Organized tree planting.

As a preliminary to terracing of the vineyards on the igneous formation where the igneous rocks weather rapidly on exposure to the winter frost no goat grazing should be permitted and the two following methods could be introduced with advantage :—

- (a) Leaving strips of natural vegetation on the contour ;
- (b) Only cultivating between the rows of vines on the contour and leaving the space between each vine uncultivated.

A feature of the agriculture of Cyprus is the absence of any system of drainage. A great deal of the gulying would be prevented if the run off water was diverted into a suitable drain at the foot of the ridges and directed to the nearest point where it would do least damage to the agricultural lands. During intense rainstorms erosion cannot be prevented, but carefully planned drainage would prevent much of the abnormal erosion on the cultivated fields.

The absence of trees on the plains is mainly on account of the system of unrestricted grazing of sheep and goats on the arable lands. Of the available grazing land for the Island 86.5% of the total grazing areas are arable lands and 12.8% and 0.5% are Hali lands and Merras, respectively. The arable land grazing consists of the stubbles after the cereal crops are harvested and a rich vernal vegetation which grows with the cereal crops and on the fallow lands. During the summer season after this spring vegetation has dried up or has been grazed as pasture for the livestock another type of vegetation occupies the same land.⁽¹⁰⁾ This new vegetation consists of perennial xerophile plants and although poor in quality it is used as a maintenance grazing during the arid part of the year. Owing to the shortage of feed towards the end of the summer all available verdure is fed to animals and shepherds even go to the extent of breaking branches of trees to bring them within the reach of the goats. Under these circumstances tree planting is impossible. The Tree Planting Law and Shepherds Licensing Law have effected considerable improvements in respect of the protection of trees and permitting the planting of young trees, but unless flock and pasture management are organized on a different system than at present and the depredations of the shepherds are not firmly dealt with, the progress in organized tree planting will be slow,

PART V.—SUMMARY OF CONCLUSIONS.

1. *The Measures necessary to prevent Abnormal Soil Erosion in Cyprus.*

The study of the physical features of the Island given in Part II (2) has shown that from the physical aspect the climate and natural vegetation may be grouped approximately in three zones and the geological formation, soils and agricultural activities correlate to a great extent with this zoning. The mountains are of the igneous formation, the soils of the foothills around the southern range are mainly calcareous and formed from the Idalian series of the sedimentary formation, and the alluvial plains have been formed by the erosion of the Pliocene and Pleistocene beds and by the deposit of silt from the mountains.

The main forests are now confined to the mountains, viticulture and arboriculture are the main agricultural activities of the hills combined with the keeping of goats in the villages in the higher altitudes and sheep and goats in the villages on the lower altitudes while the alluvial plains are mainly stocked with sheep and cereals are the main crops. The system of grazing is on a communal basis and all the cultivated and uncultivated lands are stocked to the extreme limits of its livestock carrying capacity. The cultivated lands are cropped separately by each individual peasant farmer and grazing and cropping are at variance.

The extent of erosion and measures necessary to prevent it from the general point of view also correlate with this zoning.

In the forests in the mountains and water catchment areas the forest policy should be considered in relation to erosion and water conservation.

In the hill areas where adequate vegetation is available the villagers are dependant more upon goats than their agricultural pursuits for a livelihood.

Terracing is adequately dealt with on the calcareous soil but difficulties are met in terracing the soils on igneous rocks.

The plains are overstocked with sheep and the land is denuded of surface cover through overstocking and the system of grazing. The silty soils are susceptible to erosion and the formation of gullies are prevented by the dry stone wall method but no steps are taken to plain drainage to prevent unnecessary gullying.

At one period in the history of Cyprus a considerable amount of counter erosion work must have been carried out as signs of old terraces and dry stone walls are found in practically every part of the Island and on account of these measures erosion might be very much worse than it is. Owing to the existence of these terraces and stone walls the lands of peasant proprietors who through inertia neglect taking steps to construct new terraces or stone walls are saved from excessive erosion.

Apart from forestry and its relation to erosion control and the traditional measures of dry stone walling and terracing the following further measures are considered necessary to prevent abnormal erosion in Cyprus :—

- (1) The reduction of sheep and goats in each village area to the numbers the village grazing grounds can normally support.
- (2) A change in the system of grazing from unorganized grazing to rotational grazing.
- (3) The provision of supplementary feed to grazing animals during the autumn months,

- (4) The reduction of the number of goats in the hills.
- (5) Prohibition of grazing animals on steep cultivated slopes.
- (6) The prevention of intensive "thrumbi" cutting on grazing grounds near towns and villages.
- (7) Tree planting in the plains and foothills.
- (8) The planning of a drainage system in conformity with the counter erosion methods.
- (9) Strip cropping on the contour where the donum value of crops do not justify the expense of terracing.
- (10) Cheeking the rate of flow of the streams and torrents in the mountains and hills by constructing check dams and by afforestation.

2. The Application of such Measures in Cyprus.

In order to apply the measures recommended it is necessary that peasant landholders show more initiative and enterprise in managing their land and livestock, that the village authorities organize the means by which the best use can be made of the lands of their particular area for grazing and fuel cutting and that Government support be given by the enactment or amendment of legislation where necessary.

Adequate steps can be taken by the officers of the technical Departments concerned to assist the individual landholders by propaganda and demonstration. The measures which require special attention, the technique of which the peasant proprietors appear to have very little experience are :—

- (a) Adequate drainage for the surplus run off water.
- (b) Protecting the cultivated terraced slopes in areas such as the eroding Pitsilia area.

Grazing is done on a communal basis guided to a certain extent by the Land Code, but dominated by the shepherds. Although the animals mostly belong to the village farmers, the shepherds who are landless section of the community also own a certain number of animals in each flock. The shepherds determine where and how the grazing shall be arranged and when natural pastures are scarce the landholder dare not raise objections to grazing on his land unless at the risk of injury to his person or property.

As the grazing involves the use of common and waste lands as well as the stubbles and fallows of the arable lands the organization of the grazing by the village authorities under the guidance of the Administrative officers on a more defined system would help to eliminate the malpractices of the shepherds and create better conditions for the use of the land for grazing, cropping and tree planting."

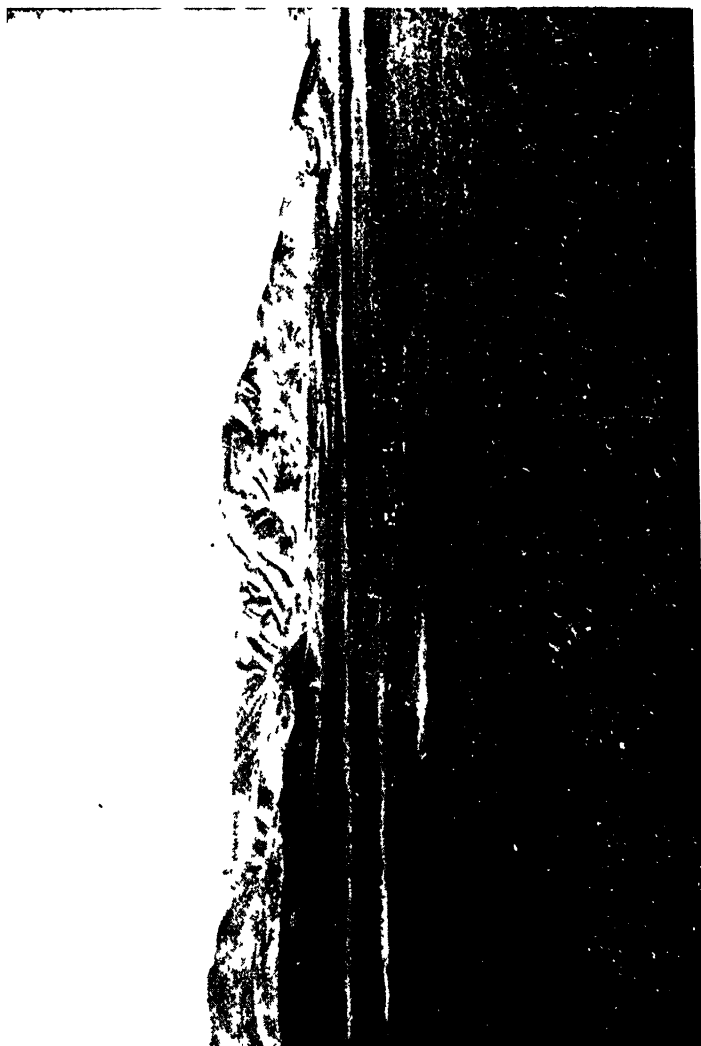
The Report gives a clear outline of the position in regard to soil erosion in Cyprus and a copy of the complete Report may be obtained on application to the Director of Agriculture or the Government Printing Office, Nicosia.



1. Low dry stone walls to prevent gully formation, Yerolakkos, Nicosia District



3. Gully control and silt pit on slope. Ayia Marina, Nicosia District.
Side view of stone wall across gully.



8. Broad terraces on gentle gradient. Ayia Marina, Nicosia District.

Farm Equipment in Cyprus.

BY A. PITCAIRN, *Assistant Director of Agriculture.*

INTRODUCTION.

MOST of the farming tools and implements now used by Cyprus farmers are similar to those which were in use in Biblical times and it is still the custom, as it was then, to plough with a wooden plough, sow broadcast by hand, reap with a sickle and thresh on the threshing-floor with a threshing-board.

In the future the picturesque yet primitive methods may no longer be a feature of Cyprus farming but owing to the diversity of the agricultural conditions of the Island the old methods may never go entirely out of use in many areas. Some progress has been made in the efforts to introduce new types of implements and by degrees farmers are replacing the wooden plough with an iron plough and introducing other types of implements and machinery.

Increased yields and improvement of quality of agricultural produce cannot be expected until the antiquated implements now at the farmers' disposal are replaced, and when the use of modern implements is more the rule than the exception the influence of the change will be far-reaching in rural progress.

THE EQUIPMENT NOW USED.

The farm equipment of a Cyprus farmer usually consists of simple tools and implements all made in the villages. In the Mesaoria most of the peasant farmers use imported iron ploughs but many of the farmers who own iron ploughs use wooden ploughs as well for breaking fallow land when first ploughing after the dry season. An implement gaining favour is a light steel cultivator and a small number of reaping machines are also used.

The normal farm equipment of a progressive Cyprus farmer consists of 1 iron plough, 2 wooden ploughs, 1 light saraclo, 1 heavy saraclo, hand hoes, sickles, 1 threshing-board, winnowing spades and forks, corn sieves and 1 mule or ox cart.

Except for one item, namely the wooden plough, the amount spent annually on the maintenance of this equipment is not high and 50% of the average amount for the annual maintenance of the equipment is spent on the wooden ploughs.

All village farmers reside in the village and their holdings are invariably divided into small plots which are scattered over a wide area. The implements are kept in a yard adjoining the farmers village house and they are transported daily when in use from the village to the field either by cart or by donkeys.

DESCRIPTION OF THE LOCALLY-MADE TOOLS AND IMPLEMENTS.

The Wooden Plough.

The Cyprus plough is made of wood cut from the Cyprus forests which is fashioned into the desired shapes of the various plough parts by village plough-makers who specialize in this work. The iron point is forged by the village blacksmith to fit each plough. The plough consists of a sole of tough wood fitted with an iron point at one end and a handle fixed in the other end to guide the plough. The beam is fixed to the sole near the handle and the width between the beam and the sole can be slightly

adjusted by a stay. To the beam is attached a draught pole at the end of which are two or three holes for the yoke. Side pieces are attached to the sole and the sides have to a slight degree the effect of the mould boards of a ridging plough. The main features in the general design are the same in all areas of the Island but the ploughs vary considerably from village to village in size and weight, width between the sole and the beam and width of sides. The actual form or forms employed in each village is determined according to local conditions after generations of experience and many farmers own several ploughs of different sizes and weights according to the depth of ploughing to be done for the cultivation of different crops or the type of soil and locality.

The wooden ploughs normally may be made or adjusted to plough to a depth of from 3" to 4½".

The maintenance of a wooden plough is high in relation to its initial cost. Breakages are frequent and wearing parts require frequent renewing. Over the course of a year all parts are renewed once and if the land is rough the beam and pole may be renewed several times during the year.

The advantages of the wooden plough are :—

- (a) The implement is easily transported to the scattered fields and is suitable to work in the small irregular shaped fields ;
- (b) No delays occur in securing spares to replace broken parts ;
- (c) When breaking fallow land it is possible to plough during the dry season or before the rains.

In the hills the wooden plough can be transported easily to and from the fields by donkeys. Although the wooden plough has certain definite advantages for use by the peasant farmers under existing conditions and method of farming and has much to commend it, especially if ploughing is carefully done, the disadvantages are many and these can only be overcome by using a modern steel plough.

The main disadvantages of the wooden plough are :—

- (a) The soil is not inverted ;
- (b) The soil is only stirred, and much land remains unploughed ;
- (c) Owing to their design there is a waste of animal draught power, therefore, more land can be ploughed by the same animals with a steel plough ;
- (d) The high cost of maintenance.

The Saraclo.

The saraclo merely consists of a wooden beam used to level the soil and make a compact seed bed for retention of moisture. Two types of saraclo are used, a heavy and a light beam. When in use the man usually stands on the beam.

Hand Hoes and Sickles.

A special heavy type of hand hoe is made locally for dealing with the thorny plants which grow abundantly. Another hand implement used by all peasants consists of a stout short handled axe and two pronged hoe combined.

The sickles are strong and similar to the ordinary reaping form of curved blade sickles used in all agricultural countries.

Carts.

The usual type of cart is a two-wheeled cart for ox or mule draught similar in design to the old Cyprus cart which was constructed entirely of wood without use of iron nails. A specimen of the old original Cyprus cart is kept at the head office of the Department of Agriculture as a museum specimen.

The Threshing-Board.

The threshing-board consists of two flat boards joined side by side. The boards are tilted upwards at the end to which is fastened the draught ropes. The underside of the boards are studded with flints which are usually got from the Limassol forest area. The threshing-floor is a specially selected level piece of ground usually circular and sometimes paved with flagstones. The sheaves are spread over the threshing-floor and threshing is done by drawing the threshing-board over the spread out sheaves until the grain is separated from the straw and the straw is thoroughly bruised. The threshing-board is drawn by a pair of oxen, mules or donkeys and the driver stands or sits on a chair placed in the centre of the board.

Winnowing and Cleaning Implements.

Winnowing shovels and forks are made from imported wood. Winnowing is done in a windy day. A plain wooden shovel and a five pronged wooden shovel are used for this purpose.

Sieves made from goat and sheep skins are in general use but sieves made of perforated tin are gradually replacing the skin sieves.

Imported Agricultural Implements and Machinery in Use.

Most types of modern agricultural implements and machinery are in use at either Government farms, estates of settlers, large chiftliks or some of the monasteries. So far as the village farmers are concerned and they cultivate over 90% of the available arable land, the types of improved and modern implements and machinery made use of are strictly limited in number and kind.

As has already been mentioned progress has been made with ploughs. A light type of wheel plough, with one, two and three furrows is the type generally favoured by the peasant farmer.

Cultivators are being used to a greater extent and the type used is a light steel cultivator.

A limited number of reaping machines are used mainly by farmers in the Mesaoria.

Little progress has been made in the use of threshing machines but the introduction of four portable power threshers by Government has stimulated interest in power threshing.

The use of harrows, rollers and other specialized forms of cultivating implements is rarely seen on the village farms.

RECOMMENDATIONS FOR IMPROVEMENT IN THE EQUIPMENT OF CYPRUS ARABLE FARMERS.

The system of farming in the plains and coastal areas is arable farming with cereals as the main crop. For dealing successfully with a main crop such as cereals it is necessary to use :—

(a) Adequate implements for cultivation.

(b) Suitable machinery for harvesting and preparing the crop for sale.

In arable farming in other countries the recognized implements necessary for successful arable farming are :—

- (1) Cultivating implements—ploughs, harrows, rollers, cultivators and hoes.
- (2) Seeding and manuring implements—seed drills and manure distributors.
- (3) Harvesting implements and machinery—sickles, scythes, reaping machines, binding machines.
- (4) Other machinery—threshing machines and winnowing machines.

Owing to the size of holding and other local conditions it is not possible for a Cyprus farmer to consider equipping himself with all the above-mentioned implements and machinery as many of them are beyond his means for purchase and maintenance but it is clear in so far as implements for cultivation are concerned a change from the existing to a new and augmented improved type should be made.

In this respect the following are recommended as compared with what are used :—

	Type now used	Type recommended
<i>Cultivating Implements</i> ..	Wooden plough .. Saraclo ..	Steel plough .. Harrows, roller, cultivators.

NOTES ON THE NEW TYPES RECOMMENDED.

Ploughs.—The disadvantages of the wooden plough have been mentioned and the change to a modern plough is desirable in order to improve the tilth of the soil ; properly cover surface growth, manure and fertilizers ; better control soil moisture and help to destroy weeds and injurious insects. Different styles of the ordinary general purpose, ploughs are required for different conditions of soil, locality, crop and state of the land and different kinds of ploughs are used for specific purposes such as one way ploughs and ridging ploughs.

The wheel plough single or double furrow is a suitable general purpose plough for the light soils of Cyprus but the choice of a plough depends entirely on individual requirements of the farmer.

Harrows.—The Cyprus farmer uses the saraclo to serve the purpose both of a harrow and a roller. The purpose of a harrow is to smooth and level the soil after ploughing, to cover the seed and to make a surface tilth. There are several forms of harrows and a suitable type for general use by the peasant farmer is the zig-zag harrow.

Rollers.—The saraclo acts as a roller but it is not sufficiently effective on a soil well prepared with steel ploughs and harrows.

In dry countries where the conservation of moisture is important rolling requires to be carefully done and if a smooth roller is used the land may require a further light harrowing after rolling. As rollers are expensive implements, many small farmers will not be able to afford this implement and the use of the saraclo should continue unless an improvised local roller can be devised or until the farmer can afford a proper roller.

Cultivators.—The field cultivator now used by certain farmers in Cyprus is a useful type of implement for the dry farming conditions of Cyprus as there are often occasions when the implement can be used instead of a plough. There are many types of cultivators and these implements are used as animal draught implements for hoeing and weeding.

Harvesting machinery is too expensive for the small farmer but farmers who can afford to do so might with advantage make more use of reaping machines.

Reaping Machines.—As the reaper-binder is a machine too expensive for the small Cyprus farmer, the problem of avoiding delays in harvesting may be overcome by more general use of reaping machines. When a farmer cannot afford this machine for his own holding, a few farmers might co-operate in purchasing a reaper. As holdings become consolidated, farmers should consider the use of reaper-binders.

Threshing Machines.—Power threshing machines are at present used by village farmers when they hire a portable power machine or use co-operative owned machines.

Winnowing Machines.—The use of hand driven winnowing machine is desirable. Besides cleaning the grain for sale it is important that all seed corn should be thoroughly cleaned before sowing.

THE APPROXIMATE COST OF THE NEW EQUIPMENT.

The implements described in the preceding paragraphs are given as a suitable standard general purpose equipment which as a whole or in part may be used to substitute the present locally-made equipment.

The approximate cost of the various implements is :—

Iron plough single furrow from	£	s.
Iron ploughs double furrow from	3	0
Harrows from	4	10
Roller from	5	0
Cultivator from	12	0
Winnowing machine	7	0
	10	0

The life and maintenance of modern farm implements and machinery depends upon the care and attention given to the implements.

A reaper may be used one month in the year only and if this machine is left in the open for the remaining eleven months the depreciation will be very heavy indeed.

The following points should always be kept in mind if maintenance expenses and depreciation are to be kept at the minimum :—

- (a) All implements must be kept properly adjusted during use.
- (b) Repairs should be effected at once and spare parts ordered at the end of each season.
- (c) Implements and machinery must be properly stored in an implement shed when not in use and expensive machinery properly protected from dampness and dust.

The capital outlay would appear to be rather high but if the expenditure is spread over a period of years and a new implement adopted as conditions and circumstances require, the change is practical and possible.

CONCLUSION.

If there is any desire for a better standard of living in the rural communities of Cyprus, life in the villages cannot improve while the standard of farming is so low and the standard of farming cannot be improved if the farmer still clings to the implements of ancient times.

The use of modern implements will result in higher efficiency in preparing the land for sowing and in harvesting the crops. Much loss of time will be avoided and farmers will be in a better position to till their land and reap their crops at the proper time and not be subject to the delays and losses during adverse weather conditions through the long time taken with inadequate and inefficient implements and machinery.

Diseases of Sheep and Goats.

(With Special Reference to Cyprus.)

BY R. MOYLAN GAMBLES, *Veterinary Officer.*

[Continued from March issue.]

PART III.—MISCELLANEOUS SPORADIC, ACCIDENTAL, AND NON-SPECIFIC AFFECTIONS.

After the various specific infectious diseases, and those caused by parasites, there remain a number of conditions caused by accidental derangement of normal function, or by otherwise harmless germs which are normally present in the body, but which may assert themselves and cause disease if the body is weakened by adverse circumstances. These are almost infinite in number, so owing to limitations of space, only a few of the most important will be dealt with.

IMPACTION.—This is the name given to the condition when any part of the digestive tract is so full of solid matter as to be incapable of functioning normally, and in acute cases may amount to complete obstruction. In ruminating animals, the first stomach or rumen is the commonest part affected. Impaction of the rumen is usually caused by over-eating, and is not often found in sheep or goats except in hand-fed animals. It is seldom seen alone, but is usually complicated by tympany and/or atony.

The animal ceases to feed, and rumination is suspended. It shows evidence of pain, but not nearly so severe as in tympany. The rumen can be felt through the left flank to be hard and solid (except where tympany is also present).

Treatment consists in softening the mass, so that it can pass onwards down the bowel. This is best done by such simple drugs as common salt, magnesium sulphate, or sometimes with ammonium carbonate, although great care must be taken to use the latter drug sufficiently diluted, as it will blister the mouth if used too strong. Common salt can be given in solid form, or mixed with treacle, and causes great thirst which induces the animal to drink large quantities of water. This becomes mixed with the mass, and softens it. Such treatment can be aided by massage through the left flank. All food should be withheld until the impaction has passed.

ATONY (*Loss of Tone*).—Atony of the rumen almost invariably accompanies and follows impaction and tympany. The muscular wall having been greatly stretched, it becomes weak, and is incapable of normal contraction. Atony can also occur by itself, usually as a result of some irritation of the fourth stomach. The animal remains dull, and without appetite, even though the impaction or tympany has passed. The rumen requires to be stimulated, and such drugs as ammonium carbonate, nux vomica and gentian are very useful. Where it occurs alone, a gentle purge should be given first to clear the fourth stomach of the cause of irritation.

TYMPANY.—This means that large quantities of gas have been produced by fermentation, and the rumen becomes blown out and drum-like. This may occur through eating excessive amounts of easily fermentible food (especially young green food), or by the gases normally

produced being unable to escape, as when the gullet is choked by an obstruction, or compressed by enlarged glands, or if the animal lies on its side for too long (as often happens when suffering from some other disease).

Mild cases can be relieved by drugs that encourage the expulsion of gases through the mouth (*e.g.* turpentine), and prevent further fermentation (*e.g.* formalin). Severe cases require surgical treatment, and the flank must be punctured to allow the gases to escape. This gives rapid relief. Stimulant treatment is required to remove the atony which follows.

ENTERITIS.—Enteritis is an inflammation of the intestines, and as well as occurring as a symptom of many specific and parasitic diseases, it can also occur as a result of eating any irritant or poisonous substance, either mineral or vegetable. It can also result from exposure to excessive heat or cold, damp, or sudden changes of temperature. These lower the resistance of the animal, and allow otherwise harmless germs to invade the tissues of the intestinal wall.

In mild cases, the only symptoms will be dullness and diarrhoea, and this will pass fairly quickly if care is taken of the animal. Treatment consists of a simple non-irritant purge, such as olive-oil or magnesium sulphate, to remove the cause, and if the diarrhoea does not cease, this may be followed by an astringent such as catechu.

Severe cases show pain, high temperature, and often a profuse diarrhoea which may be bloodstained. Treatment is along the same lines as the milder cases, but is less likely to be successful, for severe enteritis is usually fatal.

POISONING.—The various irritant poisons are too numerous to mention. If it is known what the poison is, it is sometimes possible to save the animal with a specific antidote. Otherwise, cases of poisoning must be treated along the same lines as other forms of enteritis, with palliative treatment for any other symptoms that are shown. Non-irritant poisons have various effects on different parts of the body, and there is frequently no enteritis at all. The only one that is at all common in Cyprus is sumach poisoning. In this, there is a swelling under the skin in the pale parts of the body, especially round the head and neck. Dark skin is not affected, nor are parts of the skin that are protected from the light by the fleece. The skin of the affected parts frequently dies and falls off. Prevention is by keeping the flocks away from places where sumach is growing, and the best treatment is to place the animal in a dark place for two or three days, and administer small doses of salts.

PNEUMONIA.—This is an inflammation of the lungs, and besides occurring as a complication of other diseases, it frequently occurs directly as the result of exposure to adverse conditions, such as wet, cold, or sudden changes.

The symptoms of the disease are a high temperature, and a rapid and laboured breathing. A cough is usually present. When pleurisy (inflammation of the lining membrane of the thoracic cavity) is also present, breathing becomes very painful, and the ribs are moved as little as possible, most of the breathing being done with the diaphragm and abdominal wall.

Treatment consists of stimulants (brandy is useful if there is nothing else available) and applications of mustard plaster over the ribs. The animal must be rested and kept quiet in a dry shady place with plenty of air, but not too cold. Only the lightest food should be given (a little green food) and plenty of water. If taken in time, and treated carefully, primary pneumonia can usually be cured, but in neglected cases, or where it is secondary to some other infection, it is almost invariably fatal.

MASTITIS.—This complaint is an inflammation of the udder and the teats, and is quite commonly found among sheep and goats in Cyprus. Chronic mastitis, as seen in dairy cows seldom occurs. The disease exists in two forms: suppurative and gangrenous. The suppurative may turn to the gangrenous, if not properly treated, but many cases are gangrenous from the outset.

In the suppurative form, the udder is hot, tense, and painful. The milk may be thick from contained pus, or bloodstained, or both. Treatment consists of milking out at frequent intervals, and burning the milk (otherwise the disease will be spread); and applying hot fomentations to the udder. Abscesses require to be opened surgically, and the cavities washed out with antiseptics.

In the gangrenous form, the udder turns greenish or blackish, is cold to the touch, and is frequently not painful. If any fluid can be drawn off through the teats, it is of a dirty colour and foul-smelling. The dead tissues frequently burst, giving a wounded appearance. Treatment consists in the application of antiseptics, preferably oil containing carbolic and eucalyptus, and hot fomentations at frequent intervals, to encourage the dead portion to separate and fall off. If it remains too long in contact with the living tissues, blood-poisoning may result. Surgical treatment is not desirable, as this is liable to spread the infection from the dead tissues into the healthy ones.

Both forms should, in addition to local treatment, be treated with repeated small doses of salts, to aid the body to eliminate the poisons absorbed from the udder.

METRITIS (*Inflammation of the Womb*).—This results from infection acquired during a difficult lambing or kidding, or from the foetal membranes not being expelled, and sometimes from the foetus dying before birth and decomposing.

The animal becomes dull, has no appetite, may show abdominal pain, and may strain frequently. There will also be a dirty-looking discharge from the womb. Treatment consists mainly in helping the body to eliminate poisons absorbed, by repeated small doses of salts, and by douching the womb with antiseptics and inserting pessaries, although the latter procedure is only safe in expert hands, and had better not be attempted by the owner himself.

Prevention is more important than treatment. Retention of membranes is not nearly so common in sheep and goats as it is in cows, and by far the commonest cause is from careless handling during a difficult birth. It must be remembered that these parts are very liable to dangerous infection, and no more interference should be made than is absolutely necessary. When a hand has to be inserted, it should first be thoroughly scrubbed with soap and water and then cleaned with a disinfectant. Common sense must be exercised lavishly. The most important thing is to

straighten the foetus and bring it into the normal position. Cutting should only be done as a final resort. This is done far too frequently, and the parts usually cut off are those that are already in the correct position, and the displaced parts are left as they were. Legs are useful both for straightening a foetus and for pulling, but they are frequently cut off by persons who are anxious to assist the animal, and the birth is thereby made more difficult, besides leaving sharp ends at the stumps, which may do serious damage to the womb when the foetus is eventually pulled out.

UMBILICAL INFECTIONS.—The navel of the newly-born lambs and kids should be tightly tied with clean fine string, cut, and well disinfected with iodine. Various kinds of infections may enter through the navel, if these precautions are neglected. Tetanus has been mentioned previously. There are also other infections possible, an acute form, which kills the lamb at about a week old and a more chronic form, in which the symptoms are an inflammation of the joints of the limbs, which appears up to the three weeks old. The joints are swollen, become stiff, and the lamb usually dies. If it recovers, it always remains weakly.

PREGNANCY TOXAEMIA.—This is a general disturbance that affects ewes and she-goats, usually when they are carrying two or more foetuses, and have not had sufficient exercise. The liver undergoes a fatty degeneration. Symptoms usually become visible about a week before the animal is due to give birth. The animal loses its appetite completely, becomes constipated, and shortly afterwards is unable to stand. Affected animals usually die, as the degeneration of the liver is far advanced before any symptoms begin to be shown. But if animals can be induced to abort the foetuses, they occasionally recover.

Pneumatic Tyres for Farm Carts.

THE Agricultural Department has taken steps to equip farm carts at the Central Experimental Farm with pneumatic tyres. Three carts at the Central Experimental Farm, Morphou, are now fitted with Dunlop pneumatic equipment for animal-drawn vehicles and similar equipment has been ordered for the Athalassa Stock Farm.

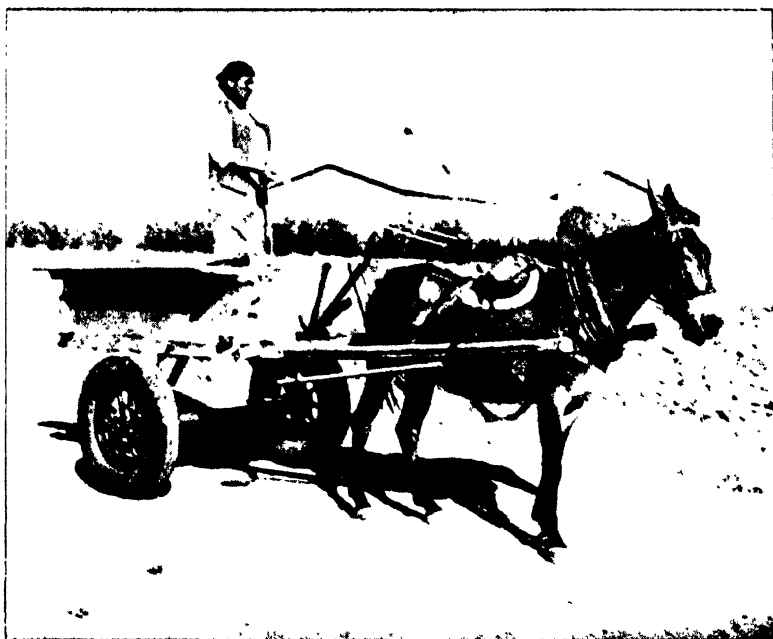
The type of cart converted from metal tyres to pneumatic tyres was the box cart type. Cart bodies were made in Nicosia by a local cart maker and the sets of Dunlop equipment consisting of axles, wheels and tyres were purchased through Messrs. Dunlops local Agents in Nicosia.

The cost of the complete cart of the design and dimensions specified by the Agricultural Department was £22. 16s. 6p. The approximate cost new of a similar type of cart with metal tyres is from £10 to £12.

The movement to equip carts with pneumatic tyres instead of metal tyres is proceeding apace in the United Kingdom and in the Colonies. In certain Colonies the initial cost of the new equipment is one of the main causes which precludes cart owners from converting to the new equipment but the new equipment has many advantages.

The main advantages of pneumatic tyred carts used on the farm are :—

- (a) A lower loading line is obtained.
- (b) Carts of larger capacity can be constructed.
- (c) Loads can be increased.
- [d]** (d) Carting costs are reduced.
- (e) Farm roads are more easily traversed in wet weather.



Box type cart with Pneumatic tyres at the Central Experimental Farm, Morphou.

Carts with pneumatic tyres used for road transport have the following advantages :—

- (a) Heavier loads are carried at a faster pace.
- (b) Bad roads are easily negotiated.
- (c) Fragile commodities are transported without jolting and damage.
- (d) Road surfaces are not damaged.
- (e) No difficulty in manoeuvring carts.

It is anticipated that progress in Cyprus will be slow in adopting this type of farm equipment as the financial difficulties which the Cypriot farmer has to face are fully realized.

There is no reason why owners of carts for road transport should not be pioneers in the change. Once cart owners in organized forms of road transport in the towns and at the ports appreciate the advantages of pneumatic tyres for their carts there will be possibilities of extending their use throughout the Island,

A.P.

Notes on Dusting Powders.

FOR the control of the various pests in Agriculture, dusting with various insecticides or fungicides powders are taking slowly but steadily an increasing importance.

Everywhere in the world, powders were used mainly as complementary treatment to the usual sprayings; in viticulture, however, powders are used more frequently. Vine growers, particularly in the main viticultural countries (France, Italy, etc.), have realized the advantage of the use of powders, as auxiliary treatment against vine peronospora, eudemis and other vine pests. Furthermore, it has been established that for the treatments of the vine diseases or pests, after June, dusting powders may constitute the principal if not the exclusive treatment of several vine diseases; this, of course, does not refer to sulphur which is used exclusively and for many years against oidium of the vine. There is no doubt that dusting powders do not last effectively so long as spraying, but their use is more economic and much more easy, and in places where climatic conditions are not so favourable to the development of fungus or pests, the control by appropriate dusting powders is quite satisfactory.

In this Island, with a climate rather dry during the growth of the vine and for our vine growers who meet with great, and sometimes insuperable, difficulties in spraying their vines against peronospora and eudemis, the system of powdering is advisable and is of a great help to them.

The practice of dusting is well known to our vine growers, since they know how to sulphur their vines, while they are not keen at all in spraying and usually sprayings, where these are made, are more or less imperfect. No one doubts that a good and proper dusting is far more useful and efficacious than an imperfectly carried out spraying.

For dusting there is no need of a spraying machine, which costs money and which most of our growers cannot afford to pay, and in their inexperienced hands spraying machines are easily put out of order.

Dusting bellows are on the contrary cheap enough and most growers are in possession of them or can easily afford the expense of purchasing them. In the vine growing districts there is a lack of water necessary for preparing the spraying solutions, or it has to be carried long distances. The preparation of the solutions as well as the spraying itself, requires also a certain experience lacking to our grower. With dusting all these inconveniences are put aside. Dusting powders are now available in the Island for use against the main vine diseases, more particularly for oidium, peronospora and eudemis.

Various proprietary powders are found in the market and their use is recommended. Vine growers are advised to seek the advice of officers of the Agricultural Department (Viticultural Section) for the best powders to use and the proper time of treatment.

EDITORIAL AND ADVERTISEMENT NOTICES

All communications for publication should be addressed to the Editor, *Cyprus Agricultural Journal*, Department of Agriculture, Nicosia.

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The "*Cyprus Agricultural Journal*" is published in March, June September and December.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

Meteorological Data, Cyprus.

SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS. FEBRUARY, 1937.

District and Station	Shade temperature			Rainfall			
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	62.57	43.50	0.61	4	0.31	2.64	—
Athalassa	—	—	0.75	2	0.62	2.36	—
Morphou	63.75	—	0.64	4	0.41	2.49	—
Makheras	—	—	—	—	—	5.06	—
<i>Famagusta District :</i>							
Famagusta	66.00	41.89	0.72	4	0.30	3.09	—
Akhyritou	63.30	42.20	0.41	3	0.19	2.20	—
Rizokarpaso	—	—	2.52	6	0.70	4.20	—
Lefkoniko	—	—	1.61	6	0.71	2.65	—
<i>Larnaca District :</i>							
Larnaca	60.00	43.00	0.48	3	0.19	3.42	—
Lefkara	—	—	2.29	7	1.05	3.77	—
<i>Limassol District :</i>							
Limassol	64.82	46.25	0.93	5	0.32	3.07	—
Saittas	—	—	2.42	6	1.53	5.58	—
Trikoukkia	47.10	34.00	3.35	8	0.75	6.86	—
Alekhtora	—	—	1.31	5	0.60	4.15	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	4.17	—
Polis	—	—	0.35	3	0.18	3.61	—
<i>Kyrenia District :</i>							
Kyrenia	63.11	47.26	0.25	4	0.10	4.84	—

Note.—This return supersedes the "Meteorological Data" published in the *Cyprus Agricultural Journal*, Vol. XXXII, March, 1937, Part I.

MARCH, 1937.

<i>Nicosia District :</i>							
Nicosia	73.48	45.97	0.02	1	0.02	0.71	—
Athalassa	—	—	—	—	—	0.78	—
Morphou	70.00	—	0.27	3	0.14	0.52	—
Makheras	—	—	—	—	—	1.51	—
<i>Famagusta District :</i>							
Famagusta	75.00	46.80	—	—	—	0.75	—
Akhyritou	72.80	42.90	—	—	—	0.80	—
Rizokarpaso	—	—	—	—	—	1.10	—
Lefkoniko	—	—	—	—	—	0.88	—
<i>Larnaca District :</i>							
Larnaca	70.58	38.54	0.18	1	0.18	0.90	—
Lefkara	—	—	—	—	—	1.09	—
<i>Limassol District :</i>							
Limassol	71.52	46.55	0.32	3	0.16	1.12	—
Saittas	—	—	0.77	3	0.38	1.83	—
Trikoukkia	60.15	42.60	1.20	3	0.50	2.98	—
Alekhtora	—	—	0.68	2	0.50	0.96	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	1.18	—
Polis	—	—	0.35	3	0.18	1.42	—
<i>Kyrenia District :</i>							
Kyrenia	68.70	43.19	0.17	2	0.15	1.09	—

Note.—Compiled from returns furnished by Public Works Department.

APRIL, 1937.

District and Station	Shade temperature		Rainfall					Dates on which snow fell
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches		
	Maxim.	Minim.						
<i>Nicosia District :</i>								
Nicosia	77.60	52.57	0.51	3	0.36	0.53	—	
Athalassa	—	—	0.40	2	0.26	0.72	—	
Morphou	75.37	48.83	0.32	2	0.23	0.41	—	
Makharas	—	—	0.20	1	0.20	0.76	—	
<i>Famagusta District :</i>								
Famagusta	77.70	53.10	0.45	3	0.28	0.39	—	
Akhyritou	76.40	50.20	0.23	1	0.23	0.43	—	
Rizokarpaso	—	—	0.55	2	0.45	0.54	—	
Lefkoniko	—	—	0.40	2	0.32	0.92	—	
<i>Larnaca District :</i>								
Larnaca	73.93	52.30	0.22	2	0.18	0.67	—	
Lefkara	—	—	0.57	1	0.57	0.95	—	
<i>Limassol District :</i>								
Limassol	74.60	52.70	0.67	4	0.54	0.60	—	
Saittas	—	—	1.56	3	1.37	1.17	—	
Trikoukkia	61.60	46.31	2.45	4	1.50	1.75	—	
Alektora	—	—	1.07	2	1.02	0.77	—	
<i>Paphos District :</i>								
Paphos	—	—	—	—	—	0.67	—	
Polis... ..	—	—	0.85	3	0.50	0.49	—	
<i>Kyrenia District :</i>								
Kyrenia	71.29	50.16	0.40	3	0.19	0.73	—	

MAY, 1937.

<i>Nicosia District :</i>							
Nicosia	82.77	57.39	2.20	7	1.38	0.96	—
Athalassa	—	—	1.91	4	0.78	0.80	—
Morphou	78.64	53.87	0.49	3	0.26	0.38	—
Macharas	—	—	2.70	6	1.05	0.79	—
<i>Famagusta District :</i>							
Famagusta	82.82	58.55	0.16	2	0.14	0.28	—
Akhyritou	80.80	55.50	0.21	3	0.12	0.26	—
Rizokarpaso	—	—	1.60	4	0.60	0.76	—
Lefkoniko	—	—	1.33	2	0.95	1.09	—
<i>Larnaca District :</i>							
Larnaca	78.70	57.50	0.82	6	0.39	0.29	—
Lefkara	—	—	—	—	—	0.31	—
<i>Limassol District :</i>							
Limassol	79.58	56.13	0.16	2	0.14	0.26	—
Saittas	—	—	3.02	7	0.95	1.10	—
Trikoukkia	66.19	47.72	3.95	6	0.80	1.45	—
Alektora	—	—	—	—	—	0.48	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	0.48	—
Polis	—	—	0.14	1	0.14	0.50	—
<i>Kyrenia District :</i>							
Kyrenia	74.71	57.97	0.36	2	0.23	0.62	—

Note.—Compiled from returns furnished by Public Works Department.

The Horse Breeding Law, 1930.

LIST OF STALLIONS LICENSED FOR 1937.

NICOSIA DISTRICT.			
<i>Village</i>		<i>Owner's name</i>	<i>Reg. No.</i>
Akaki	..	Michael Th. Rafti	29
do.	..	Elias M. Tsinga	203
Argaki	..	Polyvios Theophani	153
Astromeritis	..	Christoforos Evangeli	26
Elea	..	Rejeb Ahmed	254
Kalokhorio	..	Yioryis Papaconstantinou	262
Kato Kopia	..	Yeoryios Haji Haralambou	271
Lefka	..	Yiangos G. Boyiadji	20
Louroujina	..	Mehmed Youssouf Mukhtar	22
Lymbia	..	Andronikos Petri	32
do.	..	Kyr. Constantinou	33
Mammari	..	Nicolas Haji Haralambou	206
Meniko	..	Michaelis Haji Gibri	261
Morphou	..	Vasilis T. Spanos	18
do.	..	Andreas Ahapittas	249
Philia	..	Towlis Haralambou	255
Perakhorion	..	Tofis Paphitis	264
Strovolos	..	Hariton Christodoulou	274
Yeri	..	Yeoryos Petri	16
Yerolakkos	..	Haralambos Sophokli	194
do.	..	Hj. Michael Hj. Loi	35
LARNACA DISTRICT.			
Alaminos	..	Salih Jumaa	64
Aradhippou	..	Costis Kyriakou	15
do.	..	Lefteris Towli	225
Athienou	..	Haris Antoni	66
do.	..	Costas N. Haji Vrashimi	96
do.	..	Vasilis M. Phiakou	159
Kophinou	..	Hussein Handji Ibrahim	209
Larnaca	..	Vasilis Demetri	43
Voroklini	..	Panayis Theodosi	106
do.	..	Panayis Vasiliou Lazari	220
Athienou	..	Nicolas Vassili Yiancou	276
Aradhippou	..	Andreas Gregori Orphanou	277
FAMAGUSTA DISTRICT.			
Akanthou	..	Yiannis Hambi	270
Angastina	..	Gavriel G. Kamenou	260
Asha	..	Antonis Michael	92
do.	..	Demetris Kounallis	208
do.	..	Christos Haji Lavithi	234
do.	..	Kyriakos Antoni	239
do.	..	Petros Kyriakou	62
Leonarisso	..	Demetrios P. Tyranetti	278

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
—		—		—
Ayios Andronikos	..	Spyros Yeoryi	..	65
do.	..	Christofis Hambi	..	240
Ayios Elias	..	Constantis Stylli	..	246
do.	..	Yeorgios Christodoulou	..	265
Ayios Seryios	..	Antonis S. Gizas	..	68
Ephtakomi	..	Loizos Hambaka	..	219
Famagusta	..	Ibrahim Mehmet Kallika	..	211
Galatia	..	Akil Mustafa Gonie	..	54
Kalopsidha	..	Yeoryios Antoniou	..	267
Komi Kebir	..	Kyriakos Antoniou	..	48
do.	..	Christodoulos K. Sphongos	..	101
Kondea	..	Christos Hanni	..	259
Lefkoniko	..	Mehmed Salih	..	38
do.	..	Christos Haji Symeou	..	41
Leonarisso	..	Chrysanthos Panayi	..	56
Lysi	..	Minas Lysandrou	..	80
do.	..	Artemis Haji Constandoura	..	227
Melanagra	..	Kallis Kyriakou	..	60
Milea	..	Loizos Panayi	..	257
Do.	..	Sotira Panayi	..	193
Ovgoros	..	Djafer Emin A. M. Mustafa	..	213
Paralimni	..	Andreas K. Xiouri	..	72
do.	..	Evangelis Haji Vraha	..	172
do.	..	Evangelis Haji Vraha	..	245
do.	..	Nicolas G. Tsiakouras	..	210
do.	..	Demetris A. Maouris	..	244
do.	..	Avraamis Anastasi	..	258
Peristeronopiyi	..	Andreas Louka	..	45
do.	..	Const. K. Haji Yeoryi	..	73
Phrenaros	..	Kyriakos Theori	..	71
do.	..	Adamos Haji Theori	..	226
Rizokarpaso	..	Panayiotis K. Sakka	..	171
do.	..	Christofis N. Koulia	..	241
Sotira	..	Vasilis Demetri	..	252
Styllos	..	Annezou Nikou	..	269
Trikomo	..	Marikou Kyriakou	..	224
do.	..	Kyprianos Stylli Haili	..	266
Vatili	..	Andreas G. Iona	..	86
do.	..	Christina Prokopiou	..	88
do.	..	Vasiliki Haji Christodoulou	..	89

LIMASSOL DISTRICT.

Anoyira	..	Thoukis Solomi	..	143
Asgata	..	Demosth. Evangeli	..	119
Ay. Phyla	..	Costis P. Silikiotis	..	118

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Episkopi	..	Bairam Mehmed	..	131
Limassol	..	Mehmed Mustafa	..	40
Pakhna	..	Theodoros Evgeniou	..	121
Phasoula	..	Nicolas Evangelis	..	272

PAPHOS DISTRICT.

Amarketi	..	Mulla A. M. Mustafa	..	125
Dhrousa	..	Yiannis Sava	..	139
Kissonerga	..	Evangelis Haji Nicola	..	126
do.	..	Haji Towlis Haralambou	..	129
Kouklia	..	Mehmed Hassan Kokkinos	..	215
Ktima	..	Veli Tselebis	..	127
Kelokedhara	..	G. Christodoulou Sirimis	..	275
Lapithiou	..	Mehmed Mulla Osman	..	263
Lasa	..	Yeoryios Ch. Ellinas	..	130
Maroni	..	Panayis K. Yeorgiou	..	117
Pano Arodhes	..	Harilaos Nicolaou	..	136
do.	..	Chrysost. Panayiotou	..	214
Prodromi	..	Avraamis Sava	..	248
Steni	..	Costis Pelekanides	..	230
Stroumbi	..	Sofoklis Constanti	..	178
Terra	..	Mustafa Yusuf	..	141

KYRENIA DISTRICT.

Agri dhaki	..	Haralambos Yianni	..	147
Asomatos	..	Christallou Michaeli	..	146
do.	..	Antonis Haji I. Hanni	..	150
Ayios Amvrosios	..	Nicolas Haji Demetri	..	256
Ayios Ermolaos	..	Efstathios Christofi	..	166
Ayios Yeoryios	..	Costis N. Spanou	..	157
Bellapais	..	Savas K. D. Jirkaji	..	161
do.	..	Savas K. Demetriades	..	236
Dhiorios	..	Gregoris Haji Michael	..	148
Dhikomo, Kato	..	Loukas G. Loukaides	..	273
Kyrenia	..	Shakir Hussein	..	158
Lapithos	..	Polyk. Panayioti	..	99
do.	..	Artemis H. Proestos	..	156
Larnaka tis Lapithou	..	Ioannis Costi	..	152
Myrtou	..	Cleov. Stylianou	..	149
Sisklipos	..	Lavithis Demetriou	..	232

R. M. GAMBLES,

16th June, 1937.

*Acting Chief Veterinary Officer,
Inspector of Horse Breeding.*

Department of Agriculture, Cyprus.**HEADQUARTERS—NICOSIA.**

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

**GOVERNMENT STOCK FARM, ATHALASSA AND
DISTRICT STUD STABLES.**

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Manager, Stock Farm, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Famagusta, Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Officer in Charge of the Farm.

**SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S
LABORATORY.**

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, including the Nursery Garden, Nicosia, and Officers are stationed at Kythrea, Dheftera and Morphou.

Lefka Sub-District.—Agricultural Officer, Ibrahim Hakki Effendi, is in charge, including Pyrgos area.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA AND LIMASSOL DISTRICTS.

Agricultural Officer, Mr. M. Papaiaçovou, is in charge including Larnaca Nursery Garden. Officers are stationed at Larnaca, Skarinou, Nisou, Agros and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Kyprianides, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klokkaris, is in charge. Paphos District includes Paphos and Polis Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelo-kedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant.

Table Showing Distribution of Stud Animals at the Stud Stables and Government Stock Farm, Athalassa on 1st July, 1937.

<i>Station</i>	<i>Stallion</i>	<i>Donkey</i>	<i>Bull</i>	<i>Breed of Bull</i>
Athalassa	Waterkoscie	No. 42	Ambassador	Shorthorn
	Kildare Guard	No. 38	Monarch	Kerry
		No. 55	No. 469	Cyprus
Ay. Theodoros	Pitchford	No. 50	No. 443	Cyprus
Famagusta	Friars Flutter	No. 51	No. 461	Cyprus
Larnaca	Life Line	No. 52	No. 462	Cross-bred
Lefkoniko	Marcher Lord	No. 48	No. 468	Cyprus
Morphou	—	No. 47	—	—
Nicosia	—	—	Minstrel	Shorthorn
Ktima	—	No. 41	No. 454	Kerry
Polis	Sonny Boy	No. 49	No. 451	Kerry
Rizokarpaso	—	No. 54	No. 460	Cyprus
Vatili	Corby Bridge	No. 56	No. 458	Cyprus

Notes : 1.—There are Boars at all the above stations except Vatili, Nicosia and Morphou and he-goats at all stations except Morphou; there is a pen of R.I.R. poultry at Larnaca, Famagusta, Vatili, Lefkoniko and Ayios Theodoros Stud Stables.

2.—Boars and he-goats may be issued on loan to *bona fide* applicants upon application to the Director of Agriculture or Manager, Stock Farm, Athalassa.

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Stacks of cereals ready for threshing on the village community threshing-floors at Zodhia village.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW
OF THE
AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

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EDITORIAL NOTES

THE weather was rather cool during June for the time of year and rather unsettled, there being a few showers and a continuance of the high winds experienced during May. Hailstorms in the wine villages caused varying degrees of damage. During July the weather was normal, with high temperature and varying spells of dampness and high wind. August was cooler than normal, with a considerable amount of moisture in the air, and at times rather windy.

The threshing of cereals was completed during the early part of August and carob picking began on the 23rd of the same month, the crop proving much as was estimated (an increase of approximately 30% over last year's crop). Cotton picking also began during August and yields from the first picking were good.

Prospects for the citrus crop are distinctly encouraging. There was a heavy "June drop" of citrus and it is now thought that production may be slightly less than last season.

Planting of the winter potato crop is now completed. In some districts there is an increased acreage due to the abundance of irrigation water, but in others a smaller area has been planted owing to the discouraging effect of the low prices.

On the whole, the agricultural outlook is satisfactory.

* * * * *

RURAL DEVELOPMENT SCHEME.

Mr. Weston, Superintendent of Agriculture, has now returned from America where he has been studying rural education and extension methods employed among different sections of the rural population in the United States, Mexico and Canada.

The proposed rural development scheme in Cyprus will include work on agricultural, educational, co-operative and public health problems in a small area in which an intensive programme will be possible, owing to the fact that the workers will be stationed actually in the areas covered by the scheme and will be in continual and close contact with the villagers.

The area, or areas, in which the scheme will operate has not yet been determined as there are a number of administrative details in connection with the co-ordination of the various phases of the work still to be settled. It is, therefore, not anticipated that the scheme will come into operation much before the end of the year, owing to the amount of preliminary ground still to be broken.

TRAINING OF AGRICULTURAL ASSISTANT IN ENGLAND.

Mr. N. Papanicolas has returned from his course of training in practical general agriculture, at the Kent Farm Institute, Borden, Kent, where he was in residence during the 1936-37 session. He has now been posted to the Lysi sub-station in Famagusta District.

* * * * *

SOWING OF WHEAT IN DRILLS.—DEMONSTRATION IN FAMAGUSTA DISTRICT.

Widespread interest was shown during the last cereal season in demonstrations of a method of cultivating wheat that was new to Cyprus, although well-known in most Mediterranean countries and elsewhere. These demonstrations were in the form of two plots, side by side, carefully chosen for uniform fertility, in one of which the normal method of broadcasting the seed and covering with a *saraclo* was carried out, and in the other the wheat was carefully sown in drills by hand and twice or three times hoed during the growing period. The advantages claimed for the second method were saving of seed and all the advantages of cultivation leading to a substantially higher yield. The results of the demonstrations are very satisfactory and, after certain initial mistakes, such as making the rows too far apart, are corrected, it is confidently expected that the new system will eventually be adopted over considerable areas of the Island.

* * * * *

COTTON LAW.

Under section 7 of the Cotton Law, 1937, the purposes of which were referred to in the Editorial of the last issue of this *Journal*, segregated areas have now been declared at the village of Ayios Sozomenos and Potamia (Nicosia District) as from the 17th August.

Regulations have been drawn up controlling the storage, purchase, removal, and ginning of cotton variety Mesowhite and disposal of seed, within the segregated areas.

* * * * *

TRIAL SHIPMENT OF MESOWHITE COTTON.

After experimental work extending over several years, the Agricultural Department found that a variety of cotton known as "Mesowhite" was not only high yielding and of excellent quality, but was also well adapted to Cyprus condition. In order to test the value of this cotton on the United Kingdom market, enough was grown during the 1936 season to form a consignment of 11 bales of lint, of which rather less than half was produced at the Government Experimental Farm and the rest privately. Samples were sent to England in January, 1937, and the valuation showed clearly that only the best grade, carefully picked, was worth sending to England but that this would obtain a very satisfactory price. Accordingly the consignment of 1st grade Mesowhite cotton was sent to England on 16th April and was sold on 2nd July. The results of the sale were eminently satisfactory, a better price being realized than was estimated for the sample. Several bales, however, contained small quantities of stain and cut seed which had the effect of materially reducing the price as compared with the better graded bales.

The trial shipment of cotton has shown that Mesowhite cotton will sell readily at good prices in England, but only if great care is taken to provide a first-class grade,

SEED POTATOES.

Information has been received from Northern Ireland to the effect that there is considerable and continuous reduction in the area planted with the variety Up-to-Date, chiefly owing to the susceptibility of this variety to disease.

Importers of seed should bear in mind, therefore, that it will become increasingly difficult to obtain supplies of sound seed of this variety and should explore the possibility of replacing it with some of the newer varieties which are finding favour in Ireland.

Of the established varieties the most popular are Arran Victory, King's Pink and Arran Banner, the acreage of these grown in 1937, being : 56,850, 31,179 and 11,845 respectively, while the acreage under Up-to-Date was 2,829 only.

The Department has on trial some of the latest varieties which will shortly be available. It is hoped that recommendations will be made at the end of the present season.

* * * * *

MARKET INVESTIGATION. SULTANAS.

Following preliminary market investigations with sultanas, which were begun at the end of 1934 with encouraging results, further samples of Cyprus sultanas were submitted for examination and report to a firm in the United Kingdom.

The samples were well reported upon, especially those submitted from Paphos District for which a price of 42s. per cwt. c.i.f. London was quoted.

The importance of a clean and well graded sample was emphasized, as was the need for packing in 28 lbs. paper lined, wooden boxes.

Inquiries continue, and definite possibilities are envisaged of eventually building up a trade in this commodity, in the course of a few years, when some of the new sultana plantings come into bearing, and greater experience is obtained in processing, cleaning, grading and packing.

At present, quantities available are too small for definite potentialities of the value of the sultana as an export crop to United Kingdom to be estimated, but a start has been made, and prospects for the future are hopeful.

* * * * *

SEVERIS AGRICULTURAL PRIZES, 1937.

The following awards for the Severis Agricultural Prizes, 1937, have been made :—

Class I.—General Agriculture :

£7 to Sofronios Michaelides, Myrtou.

Class II.—Horticulture :

£2 10s. to Nicolas Avraam, Kharcha.

£2 10s. to Matheos Nicola, Dhiorios.

Class III.—Beekeeping :

£3 to Nicolas Haji Frandjeskou, Lapithos.

AGRICULTURAL COLLEGE OLD STUDENTS CLUB CUP FOR MOST ACTIVE AGRICULTURAL SOCIETY.

His Excellency the Governor has kindly presented a replica of the Agricultural College Old Students Club Cup for the most active Agricultural Society. The Lefkoniko Agricultural Society, by whom the cup was won last year, has been presented with a replica of the cup.

* * * * *

APPLE FESTIVAL AT PRODHROMOS.

An Apple Festival was organized for the first time at Prodhromos on the 29th August, 1937, for the purpose of promoting interest in the apple growing industry. The Acting Director of Agriculture attended and the festival was largely attended by visitors from the neighbouring summer resorts. The Organizing Committee merits the highest praise for the most interesting programme.

* * * * *

VETERINARY NOTES.

The annual anthrax vaccination of sheep and goats, which was carried out by the Veterinary Service from 8th April to 27th June, has been generally satisfactory, judging by the few cases of anthrax which have occurred during the summer months. The number of animals vaccinated as shewn in the following return gives some indication of the considerable reduction in the number of kids and lambs in the Colony as compared with the previous year :—

		<i>Sheep</i>		<i>Lambs</i>		<i>Goats</i>		<i>Kids</i>
		<u> </u>		<u> </u>		<u> </u>		<u> </u>
1936	..	285,306	..	91,013	..	224,420	..	139,219
1937	..	268,474	..	49,884	..	169,964	..	42,803

Flock-owners are again reminded of the importance of regular dosing of sheep and goats with copper sulphate solution. The treatment of flocks should not be postponed until the animals begin to die or to shew symptoms of stomach-worm disease regular dosing should be carried out every three or four weeks from now until late spring or preferably throughout the year. The copper sulphate is issued free of charge by the Veterinary Service.

All sheep dipping baths, of which there are now 49 in the Colony, should also be used regularly from now onwards in order to prevent severe infestation of ticks and lice in the winter months.

Flock-owners are urged to make arrangements now for the purchase and storage of vetch-straw, oats and carobs to be used in the winter. The expenditure involved will be well repaid in increased profits from milk supply and healthy vigorous lambs and kids.

Horse and Mule Breeding.

The Chief Veterinary Officer recently selected in Egypt twelve British Army mares of light draught type which the Cyprus Government purchased for the improvement of horse-breeding and mule-breeding in the Colony. Eight of these mares will be issued on loan to farmers who will be expected to use them for general farm work and for breeding to stallions approved by the Department.

ISSUE OF MULBERRY PLANTS FREE OF CHARGE.

A number of 12,740 mulberry plants were issued free of charge last season to farmers interested from nursery and school gardens for the encouragement of the silk industry.

A total of 24,990 mulberry plants is available for issue this season.

* * * * *

DEMONSTRATION SILKWORM REARINGS IN GIRLS' SCHOOLS DURING THE YEAR 1937.

Demonstration silkworm rearings were carried out during the school year 1936-37 in 111 girl's schools (101 Orthodox-Christian and 10 Moslem) where approximately 1,725 girls and boys attended the rearings and acquired a useful knowledge of sericulture.

The maximum production was 78 okes and 96 drams of cocoons per ounce of silkworm eggs and the average for 100 schools was 47 okes and 100 drams per ounce of eggs as against 76 and 46 okes respectively last year.

The average production for the Island is 24 okes and 132 drams of cocoons per ounce of silkworm eggs (1936). The new methods of hatching the eggs and the rearing of silkworms are taught to the school girls so that they may be able in future to improve their production.

The Agricultural College Old Students' Club Cup for 1937 has been awarded to the girls' school of Ayios Amvrosios (Kyrenia District) (schoolmistress, Miss Korallia Economidhou), which obtained the highest production of cocoons (78 okes and 96 drams of cocoons per ounce of eggs).

Prizes for 1937 were given by the Agricultural Department in co-operation with the Education Department to schoolmistresses. Prizes are awarded as follows :—

A prize of £1 to the best school in each district and a number of prizes 10s. each to schools which record a certain standard of production.

Demonstration silkworm rearings will be carried out next year in 124 girls' schools approximately.

The District Prizes of £1 in each district were awarded as follows :—

<i>Village</i>	<i>Name of Schoolmistress</i>
<i>Nicosia District.</i>	
Meniko	Evridiki Nicolaou
Perakhorio	Christina Michael
<i>Larnaca District.</i>	
Mazotos	Athina Nicolaou.
<i>Limassol District.</i>	
Limassol (Moslem)	Akkilé Moullahoussein.
<i>Famagusta District.</i>	
Koma tou Yialou	Panayiota Papakostantinou.
<i>Paphos District.</i>	
Amargetti	Elli Ioannou.
<i>Kyrenia District.</i>	
Ayios Amvrosios	Korallia Economidhou.



Some of the mares purchased by the Government of Cyprus for the improvement of horse breeding and mule breeding in the Colony.

Note on Agros and Lysi Agricultural Shows.

THERE were two agricultural shows held during September. The first, on 4th and 5th September, was held at Agros and drew entries from all the villages of the Pitsillia. The classes of exhibits included various deciduous fruits, nuts, grapes, potatoes, vegetables, hams, wines, etc., and in most cases were very well represented. In particular, it was noticed that the quality of the vegetables and fruits are improving steadily and the Director of Agriculture, who opened the show with the Commissioner, noted the desire of the landholders of the district to increase the area grown under fruit trees.



Lysi Agricultural Show. Judging of the class for mules with carts.

The second show was held at Lysi on 8th September and was mainly for livestock from neighbouring villages. There were some very good exhibits among the large animals and the class for a pair of mules with cart was especially striking. The agricultural exhibits were few, but in the main of good quality. Table grapes, a new product of the village, were exhibited and compared very well with the bunches of the local white and red grapes. Other noticeable exhibits were cotton, dried fruits and various vegetables. The show was officially opened by the Director of Agriculture, who presented the prizes, and the Commissioner was also present.

The Better Use of Organic Manures in Cyprus.

INTRODUCTION.

THE practice of adding organic matter to the soil in order to maintain or increase fertility is as old as agriculture itself and for many centuries has been used with great knowledge. Correct manuring is by no means a simple operation and, by exercising care, a good farmer can produce double the value from his stock of farmyard manure as a bad. In the more advanced countries of the world the use of organic manures has been increasingly availed by the production of cheap artificial fertilizers, which possess many practical advantages over the unwieldy farmyard manure heap, but it has been increasingly realized that organic manures definitely have their place in scientific farming. In Cyprus the use of artificial fertilizers is very limited as the cost is still prohibitive for the average farmer and, in general, only natural methods of manuring are possible. Unfortunately, despite the thousands of years in which Cyprus soils have been cultivated the farmers (so thrifty in most matters) have in many cases only the most meagre knowledge of the way in which to make the most of their scanty stock of manure.

There are many ways of adding organic matter to the soil, but the most important in Cyprus is the production of farmyard manure. Cyprus "village" manure is a dry, grey structureless mass consisting of fairly well decomposed humus, but containing only infinitesimal amounts of the valuable nutrients which were contained in its present substances—straw and dung. Its value lies solely in increasing the organic matter in the soil with its attendant advantages in increasing drought resistance to a small extent and exercising beneficial effects on the physical quality of the soil, which lead amongst other things to better and easier cultivation. The usual method of manufacturing village manure is briefly that the animals are given little (if any) bedding, and every few days the dung is shoveled out of the stable into a convenient heap, usually in the house yard. All the urine is allowed to run away or form evil smelling pools in the stables, and with it disappear most of the nutrients. The dung, when shoveled out of the stable still contains very valuable elements for increasing the fertility of the soil, but it takes only a short time for the pitiless Cyprus sun to cause the greater part of these to be decomposed and lost. It is quite usual, therefore, for village manure to be valueless as a fertilizer and its bad production means unhealthy stables and an untidy yard. Manure heaps have been called the "rose trees of Cyprus," for where inhabitants of most places are careful to beautify their yard with flowering plants, the Cypriot peasant prefers to obscure his view with his manure heap, and a bad manure heap at that. There is often the possibility that the centre of the manure heap may still contain a certain proportion of the nutrients, but even these are often lost as when the farmer takes his manure to the field and leaves it there for a few days before taking the trouble to plough it in.

It would appear, therefore, that several improvements could be made in the village method of manufacture, storage and application of manure. A method should be evolved by which :—

- (1) The urine is saved and incorporated into the manure.
- (2) The manure heap does not lose most its substance in storage.
- (3) The manure can be kept out of sight.

PRINCIPLES INVOLVED IN MANUFACTURE OF MANURE.

Many farmers know that the three most important food material for their crops are nitrogen, phosphate and potash compounds. All three of these are present in considerable quantities in farmyard manure, but nitrogen and potash are very easily lost. Some nitrogen is unavoidably lost before the heap is made and more can be lost by drainage into the soil and by chemical action during storage, while potash is mainly lost by drainage.

Fresh dung and litter is not farmyard manure ; first it must undergo fermentation or rotting which occurs during storage. Straw ferments best when thoroughly wetted, which explains, to a certain extent, the harmful effects of allowing the heap to dry out, although more nitrogen is also lost if this is allowed to occur.

Although loss of nitrogen is not necessarily reduced by compacting a heap, this is advisable as it aids in stopping the heap drying out. Manure from a tightly packed heap, however, must be covered as soon as it is removed to the field as otherwise nitrogen is lost very quickly in the form of a gas.

METHODS OF MANUFACTURE OF FARMYARD MANURE.

There are more ways than one to produce good farmyard manure and the question is to evolve the most suitable for use in Cyprus villages. For example the easiest way perhaps is to keep animals in an open shed. supply them with litter every night and allow them to trample, juice and compact their excreta and urine with the litter for a whole year, after which the shed is cleared and the manure used. This is unsanitary and not suitable for Cyprus conditions, although it produces a fair quality manure.

Under prevailing conditions everything points to the manufacture of manure in a pit rather than a heap. In its simplest form this would keep the manure from drying out and would keep it out of sight, but further improvement could be effected.

A basic process upon which to work would be in detail as follows : The stables should be supplied with a good quantity of litter every evening (by litter is meant cereal straw, leaves, weeds and any plant substance that is not woody) which should be sufficient to absorb most of the urine produced. Unfortunately straw is not a very good absorbant and it is always preferable to have a stable with a hard floor draining into a small tank in which the urine can be collected, but all this costs money and a mixture of straw and a little earth will hold a fair quantity of the liquid. Every day the litter and dung should be removed to the pit which would be located in a suitable place. This pit would vary in size according to the animals kept, but for the average stock of two or three oxen and a donkey it should be 12 feet to 12 feet and 5 feet deep. The bottom and sides should be made as hard and impenetrable as possible with stones, mud plaster or, best of all, concrete and some form of covering should be given. Every day the manure should be taken to the pit and compacted and, if a urine tank exists in the stable, urine should be watered in. The pit would be filled in about a year and would contain a much better product than that produced in a heap ; if the stables are carefully cleaned out once a day and if the urine is carefully conserved, to as great extent as possible, there will be the added advantage of more sanitary conditions.

However, if the manure is kept in the home yard whether in a pit or in a heap it still is an unwelcome ornament and is also the source of ill health and flies. In certain villages it brought forward the excuse that manure would be stolen if kept anywhere, but under the eye of the owner, but in the majority of cases this could be overcome and a system of communal manure heaps well away from the houses could be instituted.

A system of communal manure heaps is being urged in parts of India and seems to be well suited to Cyprus conditions. This entails two to four rows of similar sized orderly pits being dug in a convenient place. The size of pits would be roughly 12 feet by 12 feet by 5 feet and each peasant would be required to dig his own pit in the space allotted to him. If a man owned a large number of stock he would own more than one pit. The earth from the pits is thrown outside to fill up any depression in the ground or to form a guard around the pit to keep out storm water. Enough space is left between the pits to allow for the passing of carts and suitable trees are planted for protection from the sun. Pits should, if possible, be lined as previously described and covered. If a communal system such as this is employed the manure dump becomes a sanitary and efficient adjunct to the village.

The ordinary type of pit has great advantages, but there is raised the question of what to do if manure is required before it is really ready. This difficulty is got over by a more ambitious double-pit, which is of simple yet ingenious construction. A pit is dug to the required size and the floor is made sloping towards the centre, where is dug a small secondary pit. It is essential to have walls and bottom as impenetrable as possible. In the middle of the pit is built two stone walls with gaps at the bottoms, leaving an entrance to the smaller secondary pit large enough to admit a kerosene tin. The manure is dumped daily on one side of the pit until this is filled up and the liquid that drains off into the smaller pit is collected when necessary and returned to the heap. When one side is finished it is covered with earth and left while the other side is filled similarly.

GREEN MANURING.

Green manuring means the growing of a crop, preferably leguminous and ploughing it under while still in a green immature state. A legume ploughed in at the right stage will definitely increase the amount of nitrogen in the soil and also aid the physical character of the soil similarly to the addition of farmyard manure. The process also conserves a considerable amount of nitrogen and, to a certain extent, other elements, that would ordinarily be leached out of the soil. This at once suggests that green manuring would be of great value on the land in the Messaoria and elsewhere that would normally be fallow every second year. A green manure crop sown with the rains in November, and ploughed in at the latest stage before it got woody, would aid materially in conserving moisture and nutrients. Similarly it would help on land intended for summer crops, when care would have to be taken that it was ploughed under in good time to allow for decomposition before the main crop was sown. It is doubtful if green manuring will ever come into general use where the wooden plough remains in vogue, as it is almost impossible to plough in a green crop without an iron plough. Also the cost of seed is fairly considerable and the whole work would occur just at the time when the farmers had many other things to do, but the process might be used

to advantage in many cases. Under Cyprus conditions it is strongly recommended that no crop is used as green manure that is not a legume and also that the practice of green manuring of citrus and other orchards is only carried out with great care lest the decomposition in the soil of the turned in crop causes a temporary depletion of the nitrogen in the soil and consequently a setback to the trees.

SYNTHETIC MANURES.

Much attention has been drawn lately to the use of all plant residues and other organic substances for the manufacture of synthetic manures or "composts." In Cyprus, straw has a great value for feeding purposes and other plant residues hardly exist; it is, therefore, not proposed to discuss the methods of manufacture of these composts and it is considered that if any excess residues accumulate they can well be added bit by bit to the litter for the animals. It is, however, definitely not advised to plough in undecomposed straw to Cyprus fields under any circumstances with the important exception of ploughing in the stubble directly after harvest.

COMPARISON OF ORGANIC MANURES AND ARTIFICIALS.

Many experiments have been carried out and a wealth of practical details have been obtained concerning the relative merits of organic and artificial manures. Certain general conclusions have been reached and these may be of interest :—

(1) Artificial manures have a practical advantage, *e.g.* in handling and distributing, over organics, on a large scale.

(2) Correct combinations of artificials give as good increases in yields as heavy applications of F.Y.M.

(3) Highest yields in most crops are given by a combination of F.Y.M. and artificials.

(4) Where climate and environmental conditions combine to make a crop difficult to grow, organics have a distinct advantage.

Organics may prove superior to artificials in practice due to the following points :—

(1) The effects are cumulative. An application shows its effects for several years.

(2) Farmyard manure is a balanced manure and contains not only the main elements necessary for plant growth, but also small quantities of minor elements which may be necessary on certain soils.

(3) Heavy applications of F.Y.M. may exercise considerable beneficial effects in resistance to drought.

Citrus Wastage, a Reminder.

By R. M. NATTRASS, *Plant Pathologist.*

With the approach of the citrus fruit season it becomes important that those connected with the industry should turn their attention to all possible means of reducing the heavy losses that still occur during the transit of the fruit to European markets.

As has previously been stated in this Journal⁽¹⁾ wastage in citrus fruit in Cyprus is caused, almost entirely, by the familiar green and blue moulds (*Penicillium digitatum* and *P. italicum*).

These two moulds are fungi which are parasitic on the living fruit. On gaining entry into the fruit through the rind they permeate the substance of the fruit with a network of fungus threads, absorbing nourishment and bringing about the changes associated with wastage.

The most serious, and the most commonly met with, is the green mould. The first indication of this mould is a soft watery area on the fruit, which, under suitable conditions, rapidly increases in size and becomes covered with a white bloom as the fungus breaks through the rind.

This white bloom eventually changes to the familiar dusty green which indicates the production of vast quantities of spores by means of which the fungus is propagated. These spores are microscopic in size and will be discussed below.

The rind of the orange is a very efficient barrier against fungal infection. Neither of the two moulds can penetrate the uninjured rind of the healthy fruit under normal conditions.

For wastage to take place, therefore, not only must the spores be present in the atmosphere but the rind must be injured in some way before penetration can take place. Further, conditions of moisture and temperature must also be suitable for the spore to germinate and the rot to develop.

As the spores are always present, especially in the packing sheds, to a greater or less extent and the conditions of temperature and humidity are at present beyond control of the Cyprus producer, the prevention of wastage resolves itself very largely in careful handling of the fruit in all stages from picking to packing so as to avoid even the most minute injury to the rind.

The outer rind of the orange and other citrus fruits contains a number of minute oil vesicles or bladders which are covered by a very thin skin which is very readily ruptured. In fresh fruit this can be done by merely pressing the fruits together or by rubbing with the finger.

It has been shown that the green mould fungus can readily penetrate where any of these oil cells have been broken. It is obvious, therefore, that the slightest wound, invisible to the naked eye, is all that is required to break down the barrier to infection.

Most of the injury the fruit suffers is inflicted at picking time but a certain amount may take place while the fruit is still on the tree. Wounds and abrasions may be caused by movement of branches and twigs by the wind, causing chafing and thorn pricks. Attention should, therefore, be paid to pruning and the erection of efficient wind-breaks. Punctures of the fruit by certain insects such as scale and fruit fly make the fruit readily susceptible to attack by rotting fungi.

(1) Nattrass, R. M., "Prevention of Wastage in Citrus Fruit in Transit," *Cyprus Agricultural Journal*, Vol. XXX, Part 4, pp. 84-87, 1935.

At picking time the fruit is very susceptible to injury, as the rind is then turgid and delicate. This is especially so after rain and when the dew is on the fruit. Picking should not, therefore, be done under these conditions.

All persons who handle oranges should be equipped with soft cotton gloves or, at least, have the finger nails, especially the thumb nail, closely pared. The thumb nail is responsible for a great deal of the damage done to the fruit at picking and also subsequently. Cotton gloves of the type known as "housemaids" are quite suitable and cheap. When working with ladders care should be taken not to damage clusters of fruit by shaking the branches or allowing the ladder to rest against the clusters. On no account should the fruit be pulled, properly designed clippers should be used. Great care is needed in cutting the fruit. The Jaffa type of orange produces fruit in close clusters and much damage is done by forcing the nose of the clippers into the cluster. It is significant that much of the rot starts at the stalk end and in freshly-picked fruit smears of oil can generally be seen showing that the clippers have been too roughly inserted into the cluster. Two cuts should always be made when severing the fruit, the first being made some distance from the fruit and the second close to the fruit so that none of it projects and causes injury to other fruit in the picking basket. Owners of groves should adopt a proper picking bag, such as is used in most citrus-producing countries. This is slung round the neck and when full can be emptied through an opening underneath. Pouring the fruit into baskets from a height can cause much damage. It is important that all baskets and other containers used for transport of fruit should be lined with sacking and each day should be carefully inspected and all stones, splinters, etc., removed.

Fruit is also liable to become damaged during transport from grove to packing shed, especially as it is mostly carried by lorries over bad roads for considerable distances.

A more rigid container, such as the wooden lug boxes used elsewhere, would probably be more suitable for this means of transport than the baskets now in common use in Cyprus.

Much of the damage done to the fruit occurs during picking. It must be explained that picking is a skilled job and should not be left in a haphazard way to any casual labourers who may be working on the plantation. The best results are obtained when all the picking for one packing house is done by a trained gang under a competent foreman who sees that all precautions are observed. If this is not possible a foreman at least should be present to supervise the picking by the unskilled labourers. Special care in the packing shed on the part of the exporter will be of little avail if picking is done carelessly.

The process of wilting needs special consideration. It has already been pointed out that the rind of the fruit is very delicate and easily damaged. During the process of wilting a certain amount of moisture is given off and the rind becomes hardened and less liable to injury. Wilting in Cyprus is frequently inadequately done. The fruit is piled up several layers deep in an unventilated shed. Under these conditions little moisture is given off by the fruit which, even after several days is no less turgid than when picked. For efficient wilting fruit should be stacked not more than 2-3 deep on shelves made of strips of well padded wood, with ample

space for air to circulate between them. Failing this, they may be spread out not more than 2 deep on the floor of a well ventilated shed. Under these conditions 4-5 days is usually sufficient. When possible, wilting should be done in the grove to avoid damage during transport and further handling. A further advantage of wilting in the grove is that wounds that are allowed to dry are more resistant to infection than fresh wounds. There is less likelihood, therefore, of such wounds being infected on reaching the packing shed where, usually, the chances of spore contamination are increased. Under Cyprus conditions, though most of the wounding of the fruit takes place during picking, infection of the fruit by the fungus largely occurs in the packing sheds. It is, however, important to keep the source of infection in the orchard itself as low as possible by removing all fallen and any mouldy fruits that may be hanging on the trees. All such fruits should be buried.

Though the fruit after wilting is less liable to damage, the same precautions should be continued in the packing shed especially as regards the wearing of gloves and paring of the packer's finger nails. As the grading in Cyprus is all done by hand, constant supervision is required to see that at each stage the fruit is carefully handled.

As has been previously stated, the fruit on arrival at the packing shed is normally susceptible to immediate infection through the wounds sustained during picking and transport. It is of the utmost importance, therefore, that the spores in the atmosphere of the packing shed should be reduced as far as possible. Far too little attention is paid in Cyprus to packing shed hygiene. It must be remembered that a single mouldy orange can produce enough spores to infect far more than twice the number of fruits the shed will contain; each single spore is capable of starting wastage.

It may be useful at this stage to endeavour to have some idea of the extremely small size and vast numbers of these spores that may be liberated from a single mouldy fruit. The spores are so minute that one square inch of the surface of the mouldy fruit to a depth of only one spore would produce almost 16 million spores. If each spore were the size of an average Jaffa orange they would cover an area of about 70 donums, or, if each were the size of a pea and were placed in line they would reach from Nicosia to Rizokarpaso. As the layer of spores may be several spores deep and as they are being continually produced, this number will be greatly exceeded.

The necessity, therefore, of eliminating all possible source of infection will be readily appreciated. All mouldy fruit, peel and other refuse should be removed each day and placed in a pit and covered with earth or burnt. Each shed should have a few boxes with closely fitting lids into which any refuse can be placed as soon as seen.

During the process of wilting a certain amount of wastage occurs following orchard infection, it is, therefore, an added advantage that wilting should be done on the grove or at least in a separate shed so that the mouldy fruit can be removed before the bulk enters the packing shed.

In spite of these precautions a certain amount of infecting material is bound to find its way into the shed. This can only be eliminated by frequent sterilization. The floor may be washed with a disinfecting

solution, such as $\frac{1}{2}\%$ of caustic soda, and the walls sprayed with ammoniacal copper carbonate solution. Baskets in which the fruit has been brought from the grove may be dipped in the same solution before being returned for re-filling. The solution is made as follows :—

5 $\frac{1}{4}$ okes of ammonia (26°Bi.) ;
180 drams of copper carbonate ; and
350 okes of water.

The copper carbonate is made into a thin paste with the ammonia diluted with 6 okes of water, the mixture is then added to the rest of the water. It seems likely that more packing sheds will be erected in future, packers should consider designing a shed that will facilitate cleaning and disinfection.

The above remarks have dealt with the wounding of the fruit and the source of infection. A further consideration is the conditions under which the wastage develops. Maturity of the fruit is an important factor. It is well known that wastage is less likely to develop in early season shipments.

Temperature has a direct relation to the speed at which rotting takes place. The temperature at which the most rapid rotting takes place is between 65° F. and 80° F., the optimum temperature being about 75° F. At this temperature a whole fruit will become rotted in 6 days. Above 90° F. little rotting occurs and as the temperature falls below 65° F., rotting is rapidly slowed down. Thus at 40° F. it may take 30–50 days for the rot to develop appreciably. Below this temperature growth of the fungus is retarded altogether.

Humidity does not play an important part when the fungus is in the fruit as there is ample moisture present for its development. Spores of the fungus on the surface of the fruit, however, germinate more readily under conditions of high humidity. Under Cyprus conditions of packing, temperature is largely beyond control, but humidity can be kept reasonably low by providing adequate ventilation to packing sheds and especially to rooms where the fruit is being wilted.

At the time of export, especially as the season advances, the temperature of the fruit is suitable for the development of rotting fungi and in spite of precautions to prevent wounding and contamination with spores, a certain amount of wastage, during the voyage to Europe, inevitably occurs. This could be largely prevented by cooling the fruit down in pre-cooling chambers as soon as packed. If fruit thus cooled was loaded directly into refrigerated holds on board any further development would be unlikely to take place. In the absence of these facilities a further precaution can be taken of disinfecting the fruit with a fungicidal solution. Trials done by the Department during 1935 and 1936, have shown that wastage is considerably decreased by treating the fruit with a Shirilan dip. These trials have been described in previous issues of this Journal (¹).

Mechanical grading, washing, sterilizing and polishing plants are not yet in use in Cyprus and are, therefore, not discussed in this article.

(¹) Nattrass, R. M., "Citrus Wastage Trials, 1936," *ibid.*, *Cyprus Agricultural Journal*, Vol. XXXI, Part 2, pp. 52–56, 1936.

SUMMARY.

1. Do not pick during or immediately after rain or when fruit is wet with dew.
2. Use clippers.
3. Clip twice to prevent projecting stalk ends.
4. Use suitable picking bags.
5. Keep baskets clean, lined with cloth and free from stones, sticks, etc.
6. See that pickers wear gloves or have finger nails short, and the gang is specially trained or, at least, under the charge of a skilled foreman.
7. Do not overfill baskets.
8. Wilt in properly constructed rooms, if possible before transport to packing shed.
9. See that lorries are loaded in such a way that movement is reduced to the minimum.
10. Remove all fallen fruit and bury it.

Packing Shed.

1. Keep packing shed clean, remove all citrus refuse each day and bury or burn.
2. Sterilize floor, walls, baskets, grading woods, etc., frequently.
3. Make all handling fruit wear gloves.

The Cultivation of Soft Fruits in Cyprus.

BY K. HAMBOULLAS, *Agricultural Assistant.*

THE cultivation of soft fruits was almost unknown in Cyprus until the Department of Agriculture continuing its policy of introducing and experimenting with new plants and varieties, imported within the last 3 years almost all the kinds of soft fruits, namely: black and red currants, gooseberries, raspberries, strawberries, loganberries and blackberries, and is trying them out at the Nursery Garden, Trikoukkia.

The results so far obtained from some varieties are very encouraging and it is hoped that in a few years' time the inter-cultivation of these soft fruit bushes between the rows of permanent fruit trees will be of great value, especially to the grower of the hill area.

The fruit already obtained from certain varieties of gooseberries, currants and raspberries can be favourably compared with that placed on the British market.

Soft fruit bushes, owing to the fact that they do not grow very big, can be advantageously planted between the tree-rows of permanent apple, cherry, plum and other fruit trees and, as they usually start fruiting in the second year after planting, an income may be obtained very early before the permanent fruit trees come into bearing.

Fruit growers and especially those of the hill area need not have any fear as to the sale of these fruits as there will always be a great demand for them from the many visitors.

The kinds and varieties under trial at the Trikoukkia Station are as follows :—

GOOSEBERRIES.

The varieties introduced are : Keepsake, Whitesmith, Careless, Lancashire Lad, Whinham's Industry and Leveller.

The original plants were introduced from England and the bushes when planted were one year's old.

Six plants from each variety were received and planted on the 6th of December, 1935. All bushes produced from one to one and a half pounds of fruit this season. The fruit of all varieties and particularly that of Whinham's Industry, Leveller and Whitesmith was of a very high quality and the plants themselves are doing very well indeed.

Cultivation of the Gooseberry.

Soil.—Gooseberries do fairly well on most medium soils and do best on a moist light loam. Lime is very essential to the cultivation of gooseberries and unless the land contains a sufficiency of lime, it must be kept well supplied with it. 200 okes of freshly-burned water slaked white lime every two or three years is sufficient for a donum of land.

Preparation of the Land.—The land where gooseberries are to be planted should be well trenched to a depth of 2 feet, and properly cleaned from all weeds, stones, roots, etc.

A good quantity of well decayed manure should be given to the soil if good bushes carrying heavy crops are required. Gooseberries respond remarkably to good farmyard manure and about two tons per donum are recommended.

Propagation.—The usual method of propagating the gooseberry is by cuttings. These may be taken at any time from October until the end of January, but the best results are obtained when the cuttings are taken early in the autumn. Only strong shoots should be selected and these should be cut into a length of 10 inches or more.

In the preparation of cuttings, the base should be cut with a sharp knife and all the buds removed, except about 4 at the apex so that the bush grows on a "leg" about 6 to 8 inches high. Any soil is suitable for raising cuttings provided it is not too light and dry or too heavy. The best results are secured on a moist light soil.

The cuttings are planted in rows in the nursery beds at a distance of 9 inches between the cuttings and 18 inches between the rows. They should be planted 6 to 8 inches deep, with about 3 inches showing above the soil. The soil after planting should be as firm as possible and if it is noticed in the spring that the cuttings have been loosened by frost the soil should be trodden firmly again.

The cuttings must be watered from time to time. The summer treatment is to maintain a loose tilth and keep down weeds. The cuttings should be ready for planting in the following autumn or in the second year. When planting, all the new growths made during the summer should be cut back to within an inch of the old cutting.

Planting.—Gooseberries may be planted in the autumn, winter or spring whenever the land is in good friable condition. Before planting all broken or struggling roots should be trimmed off and the 3 or 4 main shoots cut back about two-thirds to an outside terminal bud.

The bushes are planted in holes opened one foot deep. The roots should be well spread out and the soil firmly trodden as it is put back. The bushes should be planted an inch deeper than they were growing in the nursery row.

Distance apart.—Gooseberries are best set at 6 feet square either when growing by themselves or as bottom fruit in a mixed plantation, but may be set closer in the rows. For weak or upright growing varieties such as Lancashire Lad 5 feet square is sufficient.

Pruning.—With gooseberries, fruit is borne at the bases of short spurs on wood from 1 to 10 years old, but the finest fruit is produced on young vigorous wood of the preceding year's growth, 5 to 6 of the strongest shoots should be selected to form the foundation of the bush and should be cut back from one-half to two-thirds according to their vigour, the weaker being cut heavier than the stronger, and all remaining superfluous material should be cut back to spurs 1 inch long for the production of fruit buds.

During the succeeding annual prunings, the chief points to remember are :—

(1) Not to crowd the bush with too many main branches. These should be so spaced as to admit free circulation of air, sun and the hand of the picker.

(2) To cut back sufficiently hard to keep the bush vigorous, to ensure a supply of young wood and to cause buds to break and form fruit spurs.

(3) Never to allow any inter-crossing of shoots but to cut back every thing growing inwards and tending to fill up the centre of the bush.

(4) To aim at replacing old worn out wood with healthy young shoots.

After Cultivation.—The land must be kept in good tilth to conserve moisture, especially as the crop is developing. Several hand hoeings must be carried out during the spring and summer months until the berries are picked. The plants during the dry period should be irrigated every 8 to 10 days and every watering should be followed by a hoeing.

In the autumn, soon after the bushes are pruned, two okes of organic manure should be given to each bush and forked into the soil.

BLACK CURRANTS.

These have been growing in Cyprus for the last few years and the fruit produced is of excellent quality. The bushes themselves are also doing extremely well. Although the bushes growing at Trikoukkia are only 3 years old the production this year averaged 2 pounds per bush.

The varieties growing at Trikoukkia are : Seabrook's Black, Boskoop Giant, and Baldwin. So far Seabrook's Black is the most promising variety.

Soil.—Black currants grow satisfactorily on most types of soils ranging from heavy loams to light sandy always provided that the texture of the soil permits of free rooting and that an adequate supply of moisture can be obtained.

Preparation of the Soil.—Before planting the land should be well manured and trenched to a depth of at least 18 inches to two feet in similar manner as for gooseberries.

The bushes are planted usually in autumn or winter in rows at 6 feet square, though certain varieties (Baldwin) may be set only from 4 to 5 feet apart.

At the time of planting, or soon after, all growths should be cut to within two buds of the base. The soil should be again quite firm after planting is completed. Soon after planting the plants should be watered and watering should be continued every 6 to 8 days if the weather keeps dry.

Treatments after Planting.—After planting, the land must be kept clean, free from weeds and in a loose friable condition. This may be accomplished by shallow digging in the winter, followed by spring and summer hoeings as for the gooseberries.

Near the bushes the digging should be very shallow to avoid damage to the masses of fibrous roots.

Organic manure appears to be most suitable and liberal supplies of this should be given every winter just before the annual winter digging.

Propagation.—The best way of propagating the currants is by hard wood cuttings, which should be taken in October or November. They should be of substantial thickness and about 10 inches long, with all buds on, so that the bushes are not grown on a "leg."

The ground should be well prepared for planting and the cuttings should be put 9 inches apart, in rows 18 inches to 2 feet apart.

After planting, the cuttings should be watered and waterings should be continued every 6 to 8 days if the weather keeps dry and hot as often happens in November and December.

During the following spring and summer the surface of the soil should be kept loose by several hoeings which also conserve moisture and prevent the growth of weeds. The bushes should be fit to be planted out at one year old.

Pruning.—Black currants usually fruit and produce their best fruit on the new year's growth and the principal aim in pruning should be to encourage the development of new shoots.

This is achieved by the removal of older shoots which have already fruited and by removing the less vigorous branches each year.

RED CURRANTS.

Red currants do better in lighter soils, and can be grown most successfully under top fruit.

The preparation of the land for planting red currants is similar to that described for black currants.

Planting and Manuring.—Red currant bushes should be set less deep than black currants and the distance for planting should be 5 feet square.

The bushes require less organic manure than black currants. In addition, this crop is favourably influenced by artificial fertilizers such as potash, phosphates and sulphate of ammonia.

The quantity to be given to each bush varies according to the age of the bushes and fertility of the soil. 12 drams of a complete fertilizer of the type 6—8—8 should be enough for each bush of 3 years old.

Pruning.—The red currant, in contrast to the black currant, bears fruit chiefly on fruiting spurs formed on the older wood and requires, therefore, a different manner of pruning.

In pruning red currants in the first few years the aim should be to produce a bush with six or seven principal branches evenly arranged so as to form an open basin to facilitate free circulation of air, sun, etc., and also to aid ripening of the fruit.

Two or three hard prunings should be sufficient to obtain this. Subsequent prunings consist of cutting the main branches back to an outside bud to leave about 6 inches of the currant growth each year. All laterals should be cut back to 1 to 2 inches close to the fruit buds at the base.

Propagation.—The red currant is easily propagated from cuttings obtained during the autumn or early winter. The red currant cuttings are prepared and planted in the same way as the *Gooseberry cuttings* and not the black currant cuttings.

The other after planting treatments of the red currant are similar to those of the black currants.

STRAWBERRIES.

The varieties at present growing at Trikoukkia are : Royal Sovereign, Sir Joseph Paxton, Oberschlesien, Tardive de Leopold, and the Duke.

These plants were introduced and planted last season. So far they are doing quite well.

Soil.—Strawberries can be grown successfully on a variety of soils ranging from light sand or peat to a heavy clay if proper cultivation is given to the soil. The ideal soil, however, for strawberries is a good medium loam.

The strawberries suffer much from excess of moisture and for this reason a well drained soil should be chosen.

Preparation of the Land for Planting.—For a new plantation the land must be thoroughly trenched to 1 foot 6 inches deep and all weeds, stones, etc., cleaned from the soil.

Plenty of well rotted organic manure should be put in the soil and forked in just before planting.

Propagation.—Strawberries are easily propagated from runners which grow abundantly on each mother plant.

The runners should be taken from plants which have shown good fruiting qualities and can be obtained either from maiden or two-year-old plants, though in practice the runners from maiden plants are much stronger than those from older plants.

To secure good runners it is essential to restrict the number taken from the mother plant to 4 or 5, and to remove all but the first runner from each of the four stolons.

A stone or wire peg placed over the stolons in close proximity to the rudimentary plantlet causes the formation of well rooted strong plants.

After the plants have rooted, they are cut off from the mother plants, and, after remaining for two weeks as independent plants, can be lifted and planted elsewhere.

Good sandy soils produce the largest runners, as this type of soil favours root development, and the roots can be lifted in all weather conditions without damaging their root system.

Planting.—The runners may be planted either in the spring or autumn, the actual time depending on weather conditions, type of soil, and the rooting system of the runners.

The runners should be planted in rows 2 feet 6 inches to 3 feet apart and 15 to 18 inches in the row. The runners should be planted firmly with a trowel at such a depth as to allow the crown to be at the soil level.

This is very important, for it has been found that unsatisfactory growth is made where runners have been planted too deep or too shallow.

De-blossoming is necessary for those planted in the late spring as the plants are very weak and cannot support a crop without damage to themselves.

The plants easily establish themselves and quite soon begin to send out young runners, which in the early part of the season should be cut off altogether although later on 4 to 5 should be left on each plant for propagation purposes as described above.

It is advisable to have 2 or more varieties planted together as strawberries when cross-pollinated set more fruit than when self-pollinated.

After Cultivation.—Several hoeings should be carried out during the spring and summer to keep down weeds and conserve moisture in the soil, and the plants should be watered from time to time.

Manuring.—The best system of manuring the strawberries is to apply well rotted organic manure during the winter months followed up by a mineral top dressing, consisting of sulphate of ammonia, sulphate of potash and superphosphates. The best time to apply this is the early spring.

Strawing.—In order to obtain a higher percentage of clean fruit strawing should be carried out just before when the fruit is getting sufficiently heavy to pull down the truss.

Barley or wheat straw is used for this purpose and is put under the trusses of the plants.

Life of Plantation.—The fruit produced by a strawberry bed in its first year is considered to be the best. In the second year it is less uniform, but the crop is heavier. In succeeding years the quality and quantity deteriorate gradually.

The actual life of a plantation depends largely on the type of soil, manure received, variety, etc., but on no account should it be more than 5 to 6 years, as by that time the quality and quantity of the fruit will have deteriorated.

RASBERRY CULTIVATION.

Varieties growing at present at the Trikoukkia Station are : Bountful, Lloyd George, Superlative, Antwerp, Red Cross, Pyne's Royal.

These varieties have produced fruit, this fruiting season of a very high quality particularly the varieties Lloyd George, and Pyne's Royal.

Soil for the Raspberry.—Raspberries can be grown on most types of soils but do best on a deep, cool, well drained loam. The plant does not seem to be affected by shade and can be grown quite well in mixed plantations under standard trees.

Preparation of the Land for Raspberries.—Special care is necessary in preparing the land thoroughly before planting raspberries because these plants root very near the surface and nothing but a surface cultivation is possible after planting.

On no account should planting be done before the land is thoroughly trenched to about 15 inches deep, and carefully cleaned from all weeds which are very difficult to eradicate after the stools have become established.

Manuring.—Rasberries respond well to organic manure and a quantity of not less than 3 tons of rotted manure per donum should be added to the soil and forked in 4 to 6 inches deep before planting.

Propagation.—The raspberry is easily propagated from suckers which grow in great numbers by each mother plant.

The suckers are obtained during the autumn or winter and are planted in their permanent positions.

Planting.—The raspberries are planted in rows made 4 to 6 feet apart and 18 inches to 2 feet between the canes.

After planting is completed the plants are cut down to 4 to 6 inches from soil level so that the efforts of the plant will be concentrated into producing strong shoots for the following year.

After planting the canes are irrigated and irrigation continues so that there is always enough moisture in the soil.

After Cultivation.—From the commencement of growth in the spring several waterings and hoeings should be carried out to keep down weeds and conserve moisture in the soil.

As the raspberry plant roots very near the surface, the cultivation should not be very deep, otherwise damage will be caused to the roots of the plants.

Well rotted organic manure should be given to the plants in the winter and in the spring, mineral dressings with complete fertilizers should be added.

Pruning.—The raspberry usually fruits on one year's wood and the old canes should be removed directly picking is finished.

The young canes are tipped in late spring at the height at which they begin to bend in order that they may support their crop.

LOGANBERRY.

Soil.—This plant on account of its robust habit can grow on most average soils where there is a good depth. It is not so exacting as regards soil conditions and provided good dressing of organic manure is given it can grow perfectly well on most types of soils.

Preparation of the Land.—The land should be well prepared before planting by trenching it to a depth of at least 18 inches and cleaning from all weeds. A good dressing of rotted organic manure should be applied to the soil before planting. Lime is also very essential for the loganberry and if there is a deficiency of it in the soil it should be applied a few weeks before planting.

Propagation.—New shoots are produced from buds formed on the rootstock. These shoots when fully grown, root naturally at the tips and so form new plants. These tip plants may be produced in an established plantation by covering the tips of fully grown canes with an inch or two of light soil in the autumn. By the early spring roots will have formed together with a basal bud and the plant may then be cut and removed.

The loganberry can also be easily propagated from root cuttings. Pieces of roots about 4 inches long are employed and should be planted up in the autumn in sandy soils. Also ripe canes may be cut into cuttings of 9 inches long and put in sandy soil.

Training and Planting.—Two methods are employed in training the loganberry. The staking and the trellising systems.

For the first system the plants are set out on the square at 4 to 6 feet apart each way. Each plant is provided with one or two good stout poles about 7 feet in height above ground, and 18 inches to 2 feet below ground level.

If one pole only is used to each plant the fruiting canes are tied to it, and the runners as they grow, are directed along the base of the rows, being tied up in place of the fruiting canes directly these have finished bearing, and have been cut away.

If two poles are used the fruiting canes are tied to the one and the runners to the other alternately. Not more than 6 canes are allowed to each pole, all others being cut away before they attain any length.

For the second system the trellis is constructed of stout durable posts of 7 feet placed at intervals of 15 to 20 feet. The posts should go in the ground 2 feet thus leaving 5 feet above ground.

Upon this framework stout No. 8 galvanized wire is stretched, three or at the most 4 strands being sufficient. The plants are put out against this trellis at 8 to 10 feet apart and the growths are tied fanwise to the wires. The trellises should be 6 feet apart.

Planting.—The planting is done either in the spring or autumn. If stock is available the autumn planting should be preferred. Holes for the plants are opened with a spade and if there is well rotted manure a forkful of it can be given to each hole.

After the plants are planted they are watered and watering continues if the weather keeps dry.

During the spring and summer months the land should be frequently hoed to keep down weeds and conserve moisture.

In the winter a good dressing of well rotted manure should be given to the plants.

Pruning.—As explained above, the fruit is borne on canes produced in the previous season, and, therefore, it is all to the good if these canes are removed as soon as they have finished fruiting. Early removal of these canes helps the next season's canes considerably. Not more than 6 canes should be allowed to grow in the case of stakes and 8 to 10 in the case of trellises, the others being removed directly they appear.

Blackberry cultivation is similar to that of the Loganberry.

Tree Planting, 1936–37.

At the end of the tree-planting season 1936 to 1937 there were 112 tree planting areas as compared with 98 at the end of the 1935–36 season.

The total number of trees planted is estimated at 166,661 in tree planting areas and 666,216 in areas other than tree planting. In addition over 3,000 donums of vines and nearly 1,000 donums of acacia were planted. These figures total more than those of the 1935–36 season owing to a large increase in the number of trees planted outside the prescribed areas, but show a decrease of 50,000 trees in those planted in the tree-planting areas.

A summary of trees planted in each district is given below :—

TREES PLANTED IN TREE PLANTING AREAS (PLANTING SEASON 1936-37).

District	Almonds	Olives	Carobs	Citrus	Vines dons.	Miscellaneous Fruit Trees	Acacia dons.	Forest trees	
Larnaca ..	64,155	2,774	4,290	898	542	3,525	178	1,322	Total trees = 166,661
Paphos ..	30,382	515	—	3,453	397	5,010	—	—	
Famagusta ..	2,620	665	230	—	4	20	33	4,420	Vines (dons.) = 983
Kyrenia ..	1,750	257	—	—	35	1,900	—	—	
Trikoukkia ..	14,500	—	—	—	—	1,000	—	—	
Nicosia ..	10,000	—	—	500	—	1,800	—	5,000	Acacia (dons.) = 211
Lefka ..	2,800	45	—	—	5	30	—	—	
TOTAL ..	126,207	4,256	4,520	4,851	983	13,285	211	13,542	

TREES PLANTED IN NON-TREE PLANTING AREAS (PLANTING SEASON 1936-37).

District	Almonds	Olives	Carobs	Citrus	Vines dons.	Miscellaneous Fruit Trees	Acacia dons.	Forest trees	
Larnaca ..	45,390	7,003	1,420	46,786	1,198	9,130	40	45,256	Total trees = 666,216
Paphos ..	38,171	2,099	—	6,560	892	8,199	—	—	
Famagusta ..	11,098	7,570	7,238	90,000	248	6,043	650	131,000	Vines (dons.) = 2,494
Kyrenia ..	2,100	1,900	—	26,500	—	3,250	—	11,900	
Trikoukkia ..	5,000	—	—	—	—	9,750	—	—	
Nicosia ..	30,000	5,000	—	15,000	—	22,500	—	25,000	Acacia (dons.) = 690
Lefka ..	14,227	1,712	—	8,375	156	14,074	—	6,965	
TOTAL ..	145,986	25,284	8,658	193,221	2,494	72,946	690	220,121	

Once again almonds proved the most popular tree with forest trees second on the list followed by large numbers of citrus and miscellaneous fruit trees. Tree planting was encouraged by the travelling officers of the Agricultural Department and also by certain Societies and Schoolmasters, but in many villages the villagers needed no more encouragement than that afforded by the numerous examples of successful tree cultivation in the district.

The season was not particularly good from a climatic point of view, there being a long dry spell during February and March, and about 20% to 25% of the trees planted are estimated to have failed.

Citrus Exports, 1936-37 Season.

There was a marked increase in the quantity of lemons exported, the season's total being 59,246 packages as compared with 37,481 packages during the 1935-36 season.

A total of 238,529 packages of oranges were exported as compared with 190,023 packages during the previous season. There was a notable increase in the quantities of bitter oranges exported and grapefruit increased from 41 packages to 416 packages during the periods under review.

The countries of destination and quantities of packages of citrus fruits exported during the 1936-37 season is given in the following statement :—

Country	Oranges pkgs.	Lemons pkgs.	Bitter oranges pkgs.	Grapefruit pkgs.	Mandarine pkgs.	Citron pkgs.	Sweet limes pkgs.
United Kingdom	154,360	56,134	2,716	374	137	2	—
Egypt	6,939	1,091	—	—	—	—	22
Aden	4,223	435	—	—	—	—	40
Port Sudan ..	7,136	12	—	—	—	—	—
Norway	29,670	170	—	32	—	—	—
Sweedon	14,028	10	—	10	—	—	—
Palestine	—	147	—	—	—	—	—
Austria	6,559	—	—	—	50	—	—
Holland	2,028	1,200	—	—	—	—	—
Ceylon	213	—	—	—	—	—	—
Finland	6,951	—	—	—	—	—	—
Poland	2,200	—	—	—	—	—	—
Denmark	500	—	—	—	—	—	—
French Somali- land	79	2	—	—	—	—	—
France	20	2	—	—	—	—	—
Singapore	334	—	—	—	—	—	—
Germany	1,163	—	—	—	—	—	—
Italy	140	—	—	—	—	—	—
Dodecanesia ..	6	42	—	—	—	—	—
Yugoslavia ..	1,923	—	—	—	—	—	—
Roumania	57	1	—	—	—	—	—
Total	238,529	59,246	2,716	416	187	2	62

The quantity and value of oranges and lemons exported during the last five years were :—

YEAR	ORANGES		LEMONS	
	Cases	Value	Cases	Value
		£		£
1932	123,892	29,372	9,529	1,719
1933	144,760	34,498	14,149	2,554
1934	219,853	58,828	14,666	2,937
1935	165,171	41,200	38,623	9,387
1936	325,220	79,413	59,152	18,695

The export season is approximately from August to June in the case of lemons and October to June in the case of oranges and the above are the official figures in cases for the calendar year.

Meteorological Data, Cyprus.

SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS.

JUNE, 1937.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	94.17	65.50	—	—	—	0.16	—
Athalassa	—	—	—	—	—	0.10	—
Morphou	90.73	60.56	—	—	—	0.02	—
Makharas	—	—	1.60	2	1.43	0.58	—
<i>Famagusta District :</i>							
Famagusta	93.48	66.03	—	—	—	0.18	—
Akhyritou	90.50	63.20	—	—	—	0.18	—
Rizokarpaso	—	—	—	—	—	—	—
Lefkoniko	—	—	—	—	—	0.23	—
<i>Larnaca District :</i>							
Larnaca	87.83	76.56	—	—	—	0.23	—
Lefkara	—	—	0.80	1	0.80	0.20	—
<i>Limassol District :</i>							
Limassol	88.60	61.83	—	—	—	0.06	—
Saittas	—	—	0.05	1	0.05	0.61	—
Trikoukkia... ..	76.07	55.50	0.40	2	0.30	0.33	—
Alekhtora	—	—	—	—	—	—	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	0.06	—
Polis... ..	—	—	—	—	—	—	—
<i>Kyrenia District :</i>							
Kyrenia	88.53	69.87	—	—	—	0.04	—

Note.—Compiled from returns furnished by Public Works Department.

JULY, 1937.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	98.58	69.87	—	—	—	0.06	—
Athalassa	—	—	—	—	—	—	—
Morphou	90.58	64.35	—	—	—	—	—
Makhaeras	—	—	—	—	—	0.08	—
<i>Famagusta District :</i>							
Famagusta	96.74	72.51	—	—	—	—	—
Akhyritou	94.10	68.60	—	—	—	—	—
Rizokarpaso	—	—	—	—	—	—	—
Lefkoniko	—	—	—	—	—	0.01	—
<i>Larnaca District :</i>							
Larnaca	93.20	71.30	—	—	—	—	—
Lefkara	—	—	—	—	—	—	—
<i>Limassol District :</i>							
Limassol	90.55	66.13	—	—	—	—	—
Saittas	—	—	—	—	—	0.27	—
Trikoukkia	76.00	61.36	—	—	—	0.06	—
Alekhtora	—	—	—	—	—	0.13	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	—	—
Polis... ..	—	—	—	—	—	—	—
<i>Kyrenia District :</i>							
Kyrenia	87.71	71.45	—	—	—	—	—

AUGUST, 1937.

<i>Nicosia District :</i>							
Nicosia	97.42	69.03	—	—	—	0.04	—
Athalassa	—	—	—	—	—	0.04	—
Morphou	92.29	65.96	—	—	—	—	—
Makhaeras	—	—	—	—	—	—	—
<i>Famagusta District :</i>							
Famagusta	97.32	71.42	—	—	—	—	—
Akhyritou	94.20	68.30	—	—	—	—	—
Rizokarpaso	—	—	—	—	—	—	—
Lefkoniko	—	—	—	—	—	0.09	—
<i>Larnaca District :</i>							
Larnaca	92.38	66.90	—	—	—	—	—
Lefkara	—	—	—	—	—	—	—
<i>Limassol District :</i>							
Limassol	91.35	67.42	—	—	—	—	—
Saittas	—	—	0.13	1	0.13	0.08	—
Trikoukkia	81.09	63.09	—	—	—	0.08	—
Alekhtora	—	—	—	—	—	—	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	—	—
Polis... ..	—	—	—	—	—	—	—
<i>Kyrenia District :</i>							
Kyrenia	89.29	72.52	—	—	—	—	—

Note.—Compiled from returns furnished by Public Works Department.

EDITORIAL AND ADVERTISEMENT NOTICES

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The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

The Horse Breeding Law, 1930.

LIST OF STALLIONS LICENSED FOR 1937.

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Louroujina	..	Mehmed Youssouf Mukhtar	..	22
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Dhrousa	..	Yiannis Sava	..	139
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16th September, 1937.

ROBERT J. ROE,
*Chief Veterinary Officer,
 Inspector of Horse Breeding.*

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Manager, Stock Farm, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Famagusta, Vati, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Officer in Charge of the Farm.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, including the Nursery Garden, Nicosia, and Officers are stationed at Kythrea, Dheftera and Morphou.

Lefka Sub-District.—Agricultural Officer, Ibrahim Hakki Effendi, is in charge, including Pyrgos area.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA AND LIMASSOL DISTRICTS.

Agricultural Officer, Mr. M. Papaïacovou, is in charge including Larnaca Nursery Garden. Officers are stationed at Larnaca, Skarinou, Nisou, Agros and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Kyprianides, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klokkaris, is in charge. Paphos District includes Paphos and Polis Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelo-kedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant.

Table Showing Distribution of Stud Animals at the Stud Stables and Government Stock Farm, Athalassa on 1st July, 1937.

Station	Stallion	Donkey	Bull	Breed of Bull
Nicosia	..	—	—	—
Athalassa	.. Waterkoscie ..	No. 42 ..	.. Minstrel	Shorthorn
	.. Kildare Guard	No. 38 ..	.. Monarch ..	Shorthorn
		No. 55 ..	.. No. 469 ..	Kerry
Ay. Theodoros	Pitchford ..	No. 50 ..	.. No. 461 ..	Cyprus
Famagusta	.. Friars Flutter..	No. 51 ..	.. No. 443 ..	Cyprus
Larnaca	.. Life Line ..	No. 52 ..	.. No. 462 ..	Cyprus
Lefkoniko	.. Marcher Lord..	No. 48 ..	.. No. 468 ..	Cross-bred
Morphou	.. — ..	No. 47 ..	.. — ..	Cyprus
Ktima	.. — ..	No. 41 ..	.. No. 454 ..	—
Polis	.. Sonny Boy ..	No. 49 ..	.. No. 451 ..	Kerry
Rizokarpaso..	.. — ..	No. 54 ..	.. No. 460 ..	Kerry
Vatili	.. Corby Bridge..	No. 56 ..	.. No. 458 ..	Cyprus

Notes : 1.—There are Boars at all the above stations except Vatili, Nicosia and Morphou and he-goats at all stations except Vatili and Morphou ; there is a pen of R.I.R. poultry at Larnaca, Famagusta, Vatili, Lefkoniko and Ayios Theodoros Stud Stables.

2.—Boars and he-goats may be issued on loan to *bona fide* applicants upon application to the Director of Agriculture or Manager, Stock Farm, Athalassa.

FERTILIZERS

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INSECTICIDES & PESTICIDES

protect them

FUMIGATION

**rids your citrus fruit and trees of scales
and makes your product easily saleable**



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agricultural and horticultural problems
and can supply all your needs**

AGENT IN CYPRUS:

O. G. CHAKARIAN,

PAPHOS STREET No. 25,

NICOSIA.

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A Village Wheelright's Shop, Kythrea Village.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW
OF THE
AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

Vol. XXXII, Part 4. DECEMBER, 1937. Price 3p.

EDITORIAL NOTES

CLIMATIC conditions were favourable during the last quarter of the year. The weather in August was cool for the time of the year, September was rather hot, but not unfavourable. Rains fell during the last fortnight of October and continued during November and prospects are good.

The carob crop was excellent, a record crop of almonds was produced, the olive crop is good and cotton production exceeds expectations. There is an increasing demand for most commodities at satisfactory prices.

Vintage ended earlier this year due to earlier ripening and the reduced crop, which is about half that of last year. Owing to the shortage of supply there was a marked rise in the prices for all vine products.

* * * * *

MEETING OF THE AGRICULTURAL ADVISORY COMMITTEE.

A meeting of the Agricultural Advisory Committee was held at the Headquarters of the Agricultural Department on Saturday, 6th November, 1937.

The Acting Director of Agriculture was Chairman of the meeting and the following members were present : The Superintendent of Agriculture, the Registrar, Co-operative Credit Societies, Messrs. Ashiotis, Stavrides, Ioannou, Nicolaides, Saadé and Mustafa Hakki Eff.

The items discussed were :—

(a) Rules for applications for ginning licences in respect of new ginneries under Section II of the Cotton Law.

(b) Soil Erosion—Memorandum submitted by Mr. Ashiotis.

(c) Improvement of olive-oil production.

* * * * *

MEETING OF THE COUNCIL OF THE CYPRUS SHIPPERS' ASSOCIATION.

A meeting of the Council of the Cyprus Shippers' Association was held at the Headquarters of the Agricultural Department on Tuesday, 7th December, 1937, at 10.30 a.m.

The Director of Agriculture was in the chair and the Trade Development Officer acted as Secretary of the meeting. The following members were present : The Comptroller of Customs and Inland Revenue, the Assistant Director of Agriculture, Mr. H. Ll. Jones, Mr. E. Disney, Mr. G. Poulas, Mr. N. P. Lanitis and Mr. G. G. Pierides.

The Council considered action taken by the Potato Export Sub-Committee and the Wine Export Sub-Committee. As no definite decisions have been taken by these Committees, it was agreed to appoint the Assistant Director of Agriculture as Chairman of the Sub-Committees for the purpose of convening further meetings.

A letter was read from Mr. J. Ioannou, a member of the Potato Export Sub-Committee, in which the question of restrictions on export of summer crop potatoes to United Kingdom was raised. Arising out of this question and in reply to an enquiry made by Mr. Jones whether there was any decrease in Tuber Moth infestation, it was agreed that provision might be made in future Orders in Council governing the export of potatoes to the United Kingdom for the issue of a special licence by the Director of Agriculture permitting export of strictly-limited consignments of summer crop for experimental purposes.

Further business considered was admission of new members' resignations and payment of subscriptions.

* * * * *

TRANSFER OF THE DIRECTOR.

Mr. D. L. Blunt, M.A., Director of Agriculture, has been selected by the Secretary of State for transfer in the Colonial Agricultural Service as Director of Agriculture, Nyasaland.

The transfer took effect from the 30th September, 1937.

* * * * *

APPOINTMENT OF DIRECTOR.

Mr. John McDonald, Senior Plant Pathologist, Kenya, was selected by the Secretary of State for appointment as Director of Agriculture.

Mr. McDonald assumed duties on the 2nd December, 1937.

* * * * *

SECONDMENT OF SUPERINTENDENT OF AGRICULTURE TO THE DISTRICT ADMINISTRATION.

Mr. B. J. Weston, Superintendent of Agriculture, has been seconded for duty in the District Administration and was appointed Assistant Commissioner, Nicosia and Kyrenia, with effect from 2nd December, 1937.

* * * * *

APPOINTMENT OF INSTRUCTOR, NORMAL SCHOOL.

Mr. A. M. Frangopoulos, Assistant to the Government Entomologist, was appointed Instructor, Normal School, as from 1st September, 1937.

Mr. Frangopoulos' new duties at the Normal School which was recently built on land adjoining the Central Experimental Farm, Morphou, consist of giving agricultural instruction to the school teachers under training at the Normal School.

* * * * *

DEPARTMENTAL PUBLICATIONS.

Bulletin No. 4, "Summary of Agricultural Legislation in Cyprus," has been printed and published by the Cyprus Government Printing Office.

NOTES ON RECENT AGRICULTURAL SHOWS.

Paphos District Agricultural and Animal Show.

The Paphos District Agricultural and Animal Show took place at Stroumbi on the 2nd and 3rd October, 1937. The Show was opened by His Excellency the Governor in the presence of a representative gathering from Paphos District including the Commissioner, and the Mayors of Paphos and Polis. The Show was held in tents in the open space in the centre of the village and the Organizing Committee are indebted to Mr. Savas Papanicola, Mukhtar of Stroumbi, for his valuable assistance in making the Show a success.

Entries in the livestock classes were poor, but any shortcomings in this respect were made up in the quality and varieties of the agricultural produce shown.

* * * * * *

LEMON DAY AT LAPITHOS, PERISTERONA AND MORPHOU AGRICULTURAL AND ANIMAL SHOWS.

The above three events were all officially opened by His Excellency the Governor.

The Lapithos Lemon Day was organized by the Mayor and members of the Municipal Corporation of Lapithos. The village industries were specially featured and a splendid display of Lapithos pottery was on exhibition.

The main feature of the Peristerona Show was the livestock and His Excellency took a keen interest in the animals brought up and he spent some considerable time in the Judges' ring during the judging of several of the classes.

A special Departmental exhibit of livestock and livestock products was staged by the Manager of the Government Stock Farm which drew considerable attention.

The Second Morphou Agricultural and Industrial Show drew large crowds from the surrounding villages. The response for entries in the various classes was exceptionally good.

* * * * * *

CITRUS EXPORTS.

The quantity of oranges exported constitutes a record for the month of November, 1937. 187,553 cases and 111 baskets were exported as compared with 104,876 cases and 100 baskets for the same month last year.

965 cases of grapefruit were exported as against 135 cases for November last year, and 358 cases of lemons.

The largest single shipment this year was 34,900 cases for Scandinavian ports. The previous record single shipment was 27,000 cases.

CORONATION EMPIRE EXHIBIT AT THE CHELSEA FLOWER SHOW, 1937.

The Council of the R.H.S. decided that at the Chelsea Flower Show in 1937, the Coronation Year should be marked by an exhibit showing the contributions made to horticulture in general by overseas flora.

All Empire countries overseas, as well as private gardeners and nurseries in England where plants from the empire had already been established, were invited to contribute to the exhibit.

Cyprus, which has long been the happy hunting ground of plant collectors, made a special effort to supply a suitable collection and many past visitors were asked to supply plants from their gardens. The chief difficulty experienced was, of course, to obtain plants which would be in flower during the Show towards the end of May—which is considerably later than the normal flowering time of spring flowers in Cyprus and necessitated the keeping of plants under suitable conditions in England to bring them into flower at the right time.

The following plants were forwarded direct to the Secretary by the Department of Agriculture.

Narcissus single,
Ranunculus asiaticus,
Narcissus double,

Anemone coronaria,
Tulipa Myrtou,
Cyclamen persicum.

The Empire exhibit covered an area of 11,000 sq. ft. and comprised of groups of plants from all Dominions and Colonies. It is understood that Their Majesties when visiting the Show made this exhibit their first objective and expressed deep interest in it.

A letter of thanks and appreciation was sent by the Council of the R.H.S. for the contribution made by Cyprus and a handsome souvenir album of photographs and a catalogue of the exhibit has now been received and can be seen in the Departmental Herbarium at Headquarters.



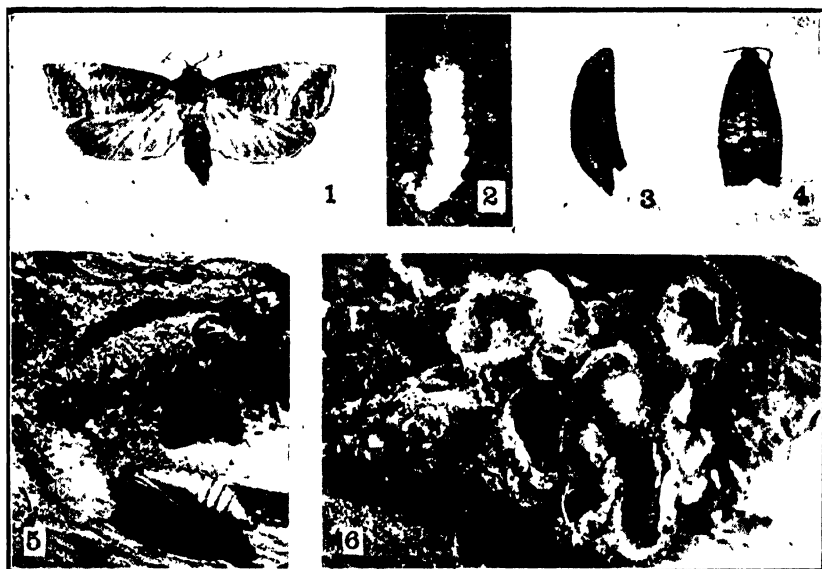
Pests of the Apple Tree.

THE CODLING MOTH.

(*Carpocapsa (Cydia) pomonella*, L.)

THE Codling Moth is probably the most widely distributed and destructive pest of apples, pears and quinces and also causes serious damage to walnuts and attacks peaches, plums, apricots and various other fruits. It is particularly a pest of apples and causes more or less severe damage in all countries where apples are grown.

The Codling Moth itself is probably not very often seen by fruit growers as it flies only at dusk, spending the day at rest on the trunks of the trees or on the leaves and does not fly unless disturbed, while its colouring makes it very inconspicuous when thus at rest. With its wings spread in flight the moth is about $\frac{3}{4}$ inch wide, while with the wings folded at rest it is rather less than $\frac{1}{2}$ inch long. The wings are chiefly grey with dark grey markings and with a large shining bronze patch towards the tip.



CODLING MOTH.

1. Adult insect. 2. Fully grown larva. 3. Pupa. 4. Adult in usual resting attitude. 5. and 6. Larva, pupae and cocoons under bark.

(All twice natural size.)

The dates and periods in the life-history given below refer particularly to the apple-growing areas of Perapedhi (altitude 2,500 feet), and Kakopetria (2,100 feet), but also apply with little change to most of the other villages where apples are an important crop. At Prodhromos (4,600 feet), however, the first moths seem to appear about 7 to 14 days later.

The earliest appearance of the moths is about the middle of April and they are abundant during May. They commence laying their eggs within two or three days of their appearance, the eggs being laid on the young leaves and fruit of apple, pear, quince and the other fruit trees liable to attack. The eggs have the appearance of small round convex white spots and are fairly easily found once they have been recognized. These eggs, in the spring, hatch in about nine to eleven days and the small, active, white larvae which emerge from them at once commence to search for a fruit in which to feed, although those which find themselves on leaves may consume a small amount of leaf first. When a larva is on a fruit it makes its way into the fruit, in a considerable proportion of cases entering the fruit at the calyx or where two fruits touch each other. Inside the fruit the larva penetrates to the centre where it feeds, destroying the seeds and other tissue and forming a dark mass of excrement and it may move to one or two other fruits in succession. The larvae are full grown in about 20 to 30 days and they then leave the fruit by tunnelling out of the side and then make their way to a suitable place for pupation. For this purpose they may walk down the trunk of the tree or, if they have fallen to the ground or if the fruit has fallen before they leave it, they may find shelter on the ground or may climb the trunk of the tree.

Suitable shelter for pupation is often found in the rough bark, under loose bark or in cracks in the tree trunk, and in such places a cocoon is formed and pupation takes place, this stage lasting about ten to fifteen days, after which period the second generation of moths appears, the whole cycle having taken about 50-75 days.

The second generation of moths lay their eggs in similar situations to those of the first generation, and the larvae on hatching enter the fruit in the same way, but the fruit being by this time larger the larvae enter at any point without showing a preference for the calyx.

The stages of the second generation are passed rather more quickly owing to the warmer conditions in the summer, the egg stage lasting about six days, but the larvae after making their cocoon do not pupate but hibernate in the larval stage until the following year when they pupate and give rise to the first generation of that year.

It does not appear that there are more than two generations a year in the apple-growing regions of Cyprus, as outlined above, although it is possible that a third generation may occur in the warmer areas where suitable fruits are grown. In the apple-growing areas it has been found that all the larvae of the first generation do not pupate but that some hibernate as larvae until the following spring, and thus there is an incomplete second generation.

Owing to adults of the first generation appearing at various dates during April, May and June and adults of the second generation during June to September, it is possible to find all stages of the insect and larvae of all sizes in the fruit during several months in the summer.

CONTROL MEASURES :

There are several measures which can be easily applied and which form a useful addition to the application of insecticides.

(a) *Scraping*.—The main trunk and larger branches of apple and other trees whose fruit is liable to be attacked by codling moth should be thoroughly scraped with a piece of bent iron or similar implement to remove all loose and rough bark. If this is done during the winter many hibernating larvae will be destroyed at the same time and there will be less shelter available in the following season, thus increasing the value of the bandages described below.

(b) *Limewashing*.—If the main trunk and larger branches of the trees are well covered with a thick lime wash during February or March many hibernating larvae will be destroyed and many of the holes and cracks in which they shelter will be closed up.



Chemically treated band in position
on trunk of apple tree.

(c) *Bandaging*.—Advantage may be taken of the habit of this insect of pupating and hibernating in cracks and hollows of the tree trunk and behind loose bark by fastening bandages of sacking or rags round the trunk or branches so that an attractive artificial shelter is formed. In order to do this satisfactorily the bandages must be thick and wide to offer plenty of shelter. These bandages should be in position by 7th June and should then be removed every 10 days, either burned or dipped in boiling water to destroy the larvae sheltering in them, and then renewed or replaced. This must be continued until about one week after all the fruit has been

collected from the trees. If this periodical destruction of the larvae is not done the bandages merely form a convenient shelter for the larvae and assist the insect to increase in numbers.

A very convenient and satisfactory alternative to the sacking or rag bandages is the chemically treated band of corrugated paper which has come into use during the last few years. This consists of a strip of corrugated packing paper about 3 inches wide, a single thickness of which is fastened round the trunk of the tree or round each main branch, the band being placed with the corrugations towards the trunk and on a part of the trunk which is fairly smooth and free from cracks. The band is kept in position either by a string fastened outside it or by one or two small nails.

These chemically treated bands should be placed in position not later than about 7th June but once placed in position they require no further attention until the end of the season, when they should be removed and burned and any larvae in cocoons on the trunk beneath the band should be destroyed. These bands provide a very attractive shelter for the larvae, which are slowly killed by the action of the chemicals contained in them. As the chemical used in treating the bands is not readily obtainable and their preparation on a small scale presents some little difficulty it is preferable to purchase this banding material ready for use.

As these bands contain oil some staining of the trunk occurs but this is unimportant on older trees; these bands should not be used on young trees with thin, smooth bark as injury may be caused to them by this oil.

(d) *Destroying Infected Fruit*.—Fruit attacked by this insect frequently falls prematurely from the tree and such fruit should be collected and destroyed, this being done daily as otherwise the larvae will have left the fruit. Any fruit unfit for use should be destroyed and any rooms in which fruit has been stored should be well cleaned to destroy any larvae which may have left the fruit and be hibernating in the room.

(e) *Spraying*.—In order to be effective against codling moth spraying requires to be carefully timed and thoroughly carried out. The times at which spraying should be done and the materials to be used are shown in the table on page 105. A first spraying of lead arsenate with a spreader should be done just after the flowers of the trees have fallen. This, it will be noticed, will be (at Perapedhi and Kakopetria) about the latter part of April and some time before the insects' eggs have hatched, which will not commence until the beginning or middle of May, but the object of this first spraying is to force a small amount of the insecticide into the calyx of the young fruit before it closes, this closing occurring soon after the fruit starts to grow. In this way the considerable proportion of larvae of the first generation which enter the fruit through the calyx will find some insecticide already there and will be poisoned before they can enter the fruit. As the young fruits are usually rather upright on the twigs it is particularly necessary that this spray should be directed from above downwards on to the calyx of the fruit.

The second spraying should be done about 15 to 20 days after the first and again using lead arsenate and a spreader, or white oil emulsion may be substituted for the spreader. The object of this spraying and of the third and other sprayings is to keep the fruit thinly covered with insecticide during the time it is liable to be attacked by young larvae, and it is necessary

to repeat the spraying in order to maintain this covering while the fruit is growing. The white oil emulsion is of value as a contact insecticide against the eggs and young larvae which are present at the time this spraying is carried out. As the young fruits are small, particularly at the time of the second spraying, a large proportion of the eggs are laid on the young leaves, and as larvae which hatch from eggs in such situations eat a small amount of leaf before reaching the fruit, it is necessary for the leaves to be thoroughly sprayed, particularly on their undersides, as well as the fruit.

The third and subsequent sprayings should be done at intervals of about fourteen days and may consist of lead arsenate and white oil emulsion, but owing to the necessity for avoiding the presence of an excessive amount of arsenic on the fruits when they are marketed it is desirable to cease using lead arsenate about 4 to 6 weeks before the fruit is picked, and during this period white oil emulsion may be used alone or nicotine sulphate may be added to it to give increased contact insecticidal effect.

Should there be an excessive amount of arsenic on the fruit when it is picked it may require special treatment to remove this arsenic before marketing, owing to restrictions on the amount of arsenic which is permitted on such fruit in certain countries. In any case fruit which when picked shows distinct traces of the spray should be wiped with a clean, damp cloth as soon as possible after picking.

SPRAYING APPLE TREES AGAINST CODLING MOTH.

TIME TO SPRAY

MATERIALS TO USE FOR SPRAYING

First Spraying :

Just after the flower petals
have fallen

Spray with lead arsenate and spreader,
(Lead arsenate 12½ drams, spreader as
required, water 10 okes, or lead
arsenate and spreader as supplied by
Agricultural Department : 1 packet,
water 10 okes.)

Second Spraying :

15 to 20 days after first
spraying

Spray as above, or white oil emulsion
(50 drams to 10 okes of water) may be
used instead of spreader with the lead
arsenate

Bandages or chemically treated bands should be in position on the trees
before 7th June.

Third Spraying :

14 days after second
spraying

As for second spraying.

Fourth and Later Sprayings :

14 days after previous
spraying

As for third spraying, but lead arsenate should not be used less than 4 to 6 weeks before the fruit is picked and therefore use white oil emulsion alone (50 drams to 10 okes of water), or nicotine sulphate may be added (5 drams to 10 okes of spray) to the last sprayings.

SMALL ERMINE MOTH (*Hyponomeuta padellus*, L.).

This is the only leaf-eating insect which is of importance as a pest of apple and plum trees in Cyprus and unless spraying is carried out it may cause complete defoliation of these trees in some localities. The larvae appear on the leaves soon after they have opened and the young leaves are quickly destroyed and the twigs are covered with a web of silk amongst which the larvae live. Later the cocoons are formed amongst this web and the moths appear in May and June. The eggs are laid in June and are rather flat and scale-like : they are laid in compact groups on the twigs and hatch in a few days, and the young larvae then remain under cover of the mass of flattened empty egg-shells until the following spring.

The earlier sprayings with lead arsenate carried out against the codling moth are also effective against the small ermine moth but if extensive webbing has already occurred the spraying is less effective owing to the protection given to the insects by the web. Spraying with petroleum emulsion during the winter and before the buds open is more effective. This petroleum emulsion is prepared by dissolving 40 drams of soft soap in $\frac{1}{2}$ oke of hot water and afterwards adding 2 $\frac{1}{2}$ okes of petroleum. This is then well stirred and heated, and then pumped while hot through a bucket pump sprayer with nozzle, either into the same tin or another, making sure that it is pumped sufficiently so that no petroleum remains on the top when it cools and all the liquid becomes milky. This is then well mixed with 22 okes of water and sprayed so that the small twigs are well wetted. The rubber hose used with the pump in preparing and in spraying this material must be well washed immediately after use or it will be spoiled.

TINGID (Lace Bug).

This insect (*Stephanitis pyri*, Geoff.) attacks fruit trees fairly severely in most areas and is particularly injurious to pears and apples. The insects live chiefly on the under sides of the leaves and their attacks cause the leaves to turn pale and to dry and fall early, and their presence is most clearly indicated by the presence of many black dots of excrement on the leaves.

Spraying against these insects with nicotine sulphate is effective and can be done, as against aphids, at the same time as the codling moth spraying. The spraying is more effective if white oil emulsion is used as well as nicotine sulphate.

APHIDS.

Various kinds of aphids attack the different fruit trees but they do not usually cause very serious damage to such trees although occasionally young shoots are attacked, when all the leaves may be made to curl up and growth of the shoots is checked.

When trees which are attacked by aphids are being sprayed against codling moth, nicotine sulphate may be added to any of the sprays being used, at the rate of 5 drams of nicotine sulphate to 10 okes of spray. When no spreader is being used with the codling moth spray it must be added when nicotine sulphate is being used. For spraying against aphids alone the spray may be prepared as follows: Dissolve 25 drams of soft soap in 10 okes of water, or in a small quantity of hot water afterwards making it up to 10 okes, and then add 5 drams of nicotine sulphate and stir well. Should treatment be required against aphids only it is unnecessary to use lead arsenate in the spray.

Spraying against aphids should be done early in the attack, before the leaves are badly rolled, and may require to be done more than once. Spraying against aphids is only effective if it is done thoroughly so that the aphids are well wetted with the spray.

The same treatment as described above can also be applied against the large dark aphids which sometimes appear on the trunks and main branches of fruit trees.

WOOLLY APHIS (*Eriosoma lanigerum*, Hausm.).

"Woolly Aphis" occurs in most areas where apples are grown but in most places it is not present in great numbers and does not appear to cause much damage to the trees, although in two or three localities it occurs abundantly and then causes appreciable injury. This aphid is easily recognized and distinguished from other aphids by the masses of white cottony wax which it produces. It attacks the young suckers, trunk, branches and shoots and also the roots of apple trees and causes the development of hard gall-like growths, in the cracks and hollows of which it lives.

This aphid can be controlled by spraying with nicotine sulphate prepared as described above but the spraying must be done with a good pressure in order to destroy the woolly aphid, owing to the protection afforded to it by its cottony covering of wax, and also owing to its living in cracks and hollows in the trunk and branches. Instead of spraying, the solution may be brushed on to the places where the cottony material indicates the presence of the insects. Another method is to paint the places where the insects are seen on the trunk and branches with unboiled linseed oil, which kills the insects and then hardens and prevents others attacking that place.

SCALE INSECT (*Parlatoria oleae*, Colv.).

Only one species of scale insect occurs commonly on apple and other fruit trees and this has the appearance of a small round whitish spot on the twigs, branches and trunk and sometimes on the fruit. They can be destroyed by the same spraying in winter with petroleum emulsion which is described for the Small Ermine Moth. Spraying in the summer against these insects is not possible owing to the risk of damaging the leaves and fruit.

WOOD LEOPARD MOTH (*Zeuzera pyrina*, L.).

This is rather a large white moth with small black spots on its wings and in the larval stage it lives inside the trunk and branches of apple and various other kinds of fruit trees where a good deal of damage is caused, branches and whole trees being gradually killed. The presence of the insects in the trees is indicated by the occurrence of a small amount of sawdust-like material which they cause to fall out of their holes. The insects inside the trunk and branches are protected from the usual kinds of treatment but can often be destroyed by means of a wire pushed into the hole as far as possible, or a few crystals of paradichlorobenzene can be placed in the hole and the hole then closed with grafting wax or clay.

BLOSSOM WEEVIL (*Anthonomus pomorum*, L.).

This weevil lays its eggs early in the spring in the unopened flower buds of apple and pear and the larvae live inside the buds and destroy them. When a flower is attacked it does not open, the petals remaining closed as in a flower about to open and instead of opening the petals turn brown and dry.

When the attack is small it is not of any importance as a proportion of the flowers would fail to form fruit in any case, but when the attack is severe great loss of crop may be caused.

The adult insects emerge from the dead buds at the end of April or in May and feed a little on the leaves but soon seek shelter in which they remain until the following spring. For this purpose they shelter under the bark of fruit trees or other trees, under stones, in loose stone walls, etc.

There is no very satisfactory treatment against these insects. Spraying has little effect as the adults feed for a short time only and the larvae are protected inside the dried flowers. Some adults will take shelter in bandages similar to those used against codling moth if they are placed in position early in May, and they can then be dealt with in the same way, chemically treated bands being equally as effective against this insect as against codling moth. The dried flowers can be collected from small trees and destroyed, this being done before the middle of April.

A similar insect (*Anthonomus cyprinus*, Marshall) attacks the flower buds of peach and almond trees in a similar manner.

MEDITERRANEAN FRUIT FLY (*Ceratitis capitata*, Wied.).

This pest, although chiefly known as a pest of citrus fruit, also attacks most other kinds of fruit, including apple, pear, plum, peach, apricot, etc. A full account of this insect and of the measures which can be applied against it was given in the *Cyprus Agricultural Journal* for September, 1936, and in Agricultural Department, Leaflet No. 21.



The Cultivation of the Carob Tree in Cyprus.

By O. NOURI, Dip. Agr., Assistant Agricultural Superintendent.

Description.—The carob tree (*Ceratonia siliqua*) is an evergreen belonging to the natural order of Leguminosae to which all pulse crops belong. It has a very strong penetrating tap root with great power to make use of a minimum supply of soil moisture; its crown stands on a stem 4'–6' high and the total height of the tree may be up to 40', the branches shading a circle of 40' diameter. The mature leaves are dark green but during the growing season the newly-formed leaves are pale green, while the tips of the young shoots are reddish in colour. The leaves are composite and consist of 3–5 pairs of leaflets in feather-like form. The flowers have their own peculiarities for they are born on a common axis, the latter itself appearing every year, from August to December, on the stem or branches. These axes are red in colour and are called "strings" and they may be produced on all branches of any age, but usually on branches of over two years. For all practical purposes the individual flowers may be classified as hermaphrodites (male and female on the same flower) but there are individual trees which bear flowers with male organs only and such trees never set fruit. On each "string" there may be as many as 40–50 flowers but actually 5–10 flowers only set fruit. The fruit consists of a long pod, green in colour during the growing season (January–July), and turning black at the approach of maturity (August). The pods are fleshy and sugary, and contain 5–15 red, very hard seeds, which are formed in separate cavities along the centre of the pod.

Climate and Soil.—The carob is a typical Mediterranean tree. It thrives in regions having mild winters, reasonably low rainfall, and hot summers with humid atmosphere. Prolonged snow and frost will do irreparable damage to the trees. Also very dry winters if repeated successively for 2–3 years will badly retard the growth and vigour and the production will be set back for at least 3 years. An average of 12" rainfall registered during the winter months (November–February) should be considered as satisfactory for good bearing of carob trees. It is further observed that carob trees thrive and bear best in coastal regions. The carob tree can grow and bear fruit up to an altitude of 2,500 feet, but maturity is retarded by 15–20 days in elevated areas. In its habitat it grows side by side with the olive tree and most of the plantations are a mixture of these two trees.

Soil.—The carob tree thrives best on deep chalky soils with somewhat compact formation and on slopes. Southern slopes are best but other sites may be suitable, provided they are subject to coastal conditions. On deep loams the carob does consistently well and the fruit is uniform and plump, but on heavy clays and on soils with heavy clay subsoils, the tree will not develop satisfactorily and its existence will be very precarious. Igneous formations seem to be less favourable for it than limestone formations, but it can establish itself even on the most rocky limestone formations, provided there are some crevices for the first roots to take a hold.

Transplanting Nursery Plants from Pots.—The land should be ploughed in spring if possible and kept clean during summer months by harrowing 2–3 times or more. In about August–September the plantation should be planned out and holes opened immediately after, the size of the holes being $2' \times 2' \times 1\frac{1}{2}'$ and the spacing 30'–40'. Following the first heavy autumn rains the holes should be filled back with the addition of some rotted manure. The nursery plants in pots are then carried on the spot leaving one pot to each hole. A small pit, the size of the pot, is opened in the centre of the refilled hole, the pot is turned upside down, the plant is held among the fingers and the palm of the hand covers the soil in the pot. Then the brim of the pot is lightly tapped against a stone, care being taken not break the plant. By doing so the plant is taken out of the pot together with the ball of earth which surrounds it without disturbing the roots. The whole ball of earth is placed in the pit with the plant in the centre and the soil compacted around by pressing with hand or by trampling. As the soil should contain sufficient moisture irrigation is not necessary but if the soil is dry about 2 gallons of water should be put into each hole after planting. Stakes placed in the holes will make the spots where the young carobs are planted more conspicuous.

Treatment after Planting.—During the summer months following planting it is necessary to assist the plant by irrigation and hoeing. Hoeing may be started in April and repeated once a month or after every irrigation or heavy rain. As regards the irrigation this may not be necessary until June, provided the land is properly hoed and three irrigations throughout the summer should be sufficient. 2–3 gallons of water applied to each hole every time is sufficient. If the plants make vigorous growth during the first year it may not be necessary to irrigate during the following years. All that is to be done is to make proper basins during the winter months in order to collect and store as much water as possible and keep the basins hoed during summer months. When the plants are about 30" high they should be staked properly. Strong stakes standing about 4' above the ground level are preferable. Staked plants stand the adverse effects of the winds and make quicker and more vigorous growth. When the stems, which should be straight and single, is about $1\frac{1}{2}"$ in diameter at height between 4'–5' budding takes place, at this time the plant is 4–5 years old from seed.

Treatment after Budding.—The result of a successful budding is a very strong, straight shoot which seldom produces lateral branches in the first year. Before the second year growth starts on the shoot this should be cut back to about 10 inches above the bud point and only 2 or 3 lateral branches are allowed to grow in the second year. These 2 or 3 branches may form the basic frame of the tree and it is preferable to keep the frame within this number, but by cutting back in the following year a frame with 4 or 6 branches may be obtained. There is no other point to observe in the formation of the head of a carob tree and it should be left alone to take its natural shape. Only the branches that tend to overcrowd, backward growth, and broken or otherwise damaged branches should be removed annually with a clean cut.

Fruit Bearing and Production of Carob Tree.—A budded carob tree produces its first fruit, usually in the third year after budding, that is to say under normal conditions 7–8 years after sowing the seed. The first year's

crop may consist only of a dozen bunches of carobs weighing about 2 okes. From now on under normal conditions the production increases every year, and when the tree is 10 years old from budding its production may be about 30 okes. At 30 years the production may be as high as 100 okes. An individual mature carob tree may produce as much as 1 ton of carobs in a good year but this is exceptional. However, it should be borne in mind that the carob tree is not a regular cropper. The cropping is divided into 3 class years: (a) heavy, (b) medium, (c) poor. Under normal weather conditions there are approximately 2 medium, 1 poor and 1 heavy crop year. These remarks are for each individual tree and not for a whole plantation. The medium crop years are not the average of the four years, but usually less. The average annual production of a good, well shaped, properly distanced carob tree may be taken as 45 okes.

Gathering of the Fruit.—Carobs reach maturity about the middle of August. Mature carobs, when lightly touched or beaten with the point of a stick, detach easily from their hold and fall to the ground. Harvesting is done by gently detaching the carobs with a long pole and dropping them on the ground. Fruits falling on the ground do not suffer any damage. From the ground they are collected and filled in baskets and these in turn are emptied into large bags or are taken in bulk in lorries or carts to the carob stores in the villages. In certain places carobs are stored into open air heaps near a shipping port, but unless early shipment is to take place this practice is not recommended.

ANNUAL CARE OF CAROB GROVES.

Cultivation.—The carob tree can grow in small crevices of rocks where no cultivation can be undertaken but in places where the land is somewhat clear of stones it is a good practice to make two winter ploughings in order to facilitate the collection and storage of rain water. Where there are large spaces among the trees of a naturally established carob grove winter cereals are grown successfully and it is observed that this practice highly benefits the trees.

Manuring.—Carob trees are not manured and it is doubtful if the application of manures or fertilizers will have any beneficial effect on the trees. It is better not to spend money for this purpose.

Pruning.—Pruning of an orchard tree is generally made in order to make it more productive and healthy. There is no question of fruit bearing branches of a carob tree. The flower may appear on any part of the tree. Therefore, no pruning can be applied with this object in view. On the other hand the trees require a certain amount of cleaning every year in order to prevent overcrowding. Hence the main annual prunings are confined to the removal of branches that shoot out on the main frame branches and the weak, backward crooked ones and those which tend to interlace with other branches.

But the following points should be borne in mind in order to apply timely pruning:—

(a) After harvest a certain number of branches get broken either by beating or climbing on the tree in order to reach top fruits. These branches must be removed with a clean cut immediately after.

(b) Branches gnawed by rats should be cut twice a year, in September-October and in February-March.

(c) Carob trees get badly damaged during gales and several big branches are broken. In such cases the trees should be inspected early and all broken branches should be removed and the wounds given a clean cut with an axe.

Pruning under the above-mentioned circumstances is very important. Unless such broken or damaged branches are removed in time and the wound repaired with a clean cut and smeared with tar rotting will soon start and spread to the heart of the tree. The result will be the rotting of the heartwood of the tree which will lead to a hollow stem. This condition makes the tree less resistant to the winds and gives shelter to various rodents and particularly to rats which are among the most dangerous enemies of carob trees. It should always be borne in mind that a wound on a carob tree must be clean cut, and larger wounds smeared with tar.

Regeneration.—The carob tree lives more than a century and given normal conditions the question of regeneration does not arise for some generations. But every year several carob trees reach the age limit, they are broken down by wind or by natural weight, and consequently, the regeneration of a certain number of trees every year must be considered. The carob tree readily sends out shoots on all its trunk as well as at its collar and from its roots which are not buried deep. In order to regenerate a tree it is necessary to cut the old trunk level with the ground and induce it to produce new shoots. Sometimes these shoots naturally form at the bottom of an old tree before the tree is cut down, thus indicating more or less the necessity for regeneration. From the collar and the root of the old tree several young shoots grow. If goats are not kept off these shoots are regularly bitten forming a kind of bush growth never getting a chance to produce the leaders. It is necessary to choose the leader of the future tree. There may be as many as 5-7 leaders in a group having a distance of 5'-7' among each other and all the trees in the group should be considered as forming a single tree. The leaders are dealt with as described elsewhere, budded and brought into bearing with desirable type of fruits. The trees in a group might not reach the normal size of a carob tree but the proportional bearing will be more or less the same as for a good single tree.

Varieties.—For all practical purposes it may be said that there are no varieties of carobs except the wild carob which has a very thin, papery pod of a light chestnut colour and which have no commercial value. The commercial type of carob which is fleshy, sugary, and plump, contains honey and is a dark chestnut colour. There are several local strains of this second type but the distinction is brought about mainly under the climatic and soil conditions and the strain does not keep its qualities when grown in other localities. Therefore, much importance cannot be attached to the various names such as Countoura, Apostoliki, Templotiki, Kyreniotiki, Sarakina, Vaklitiki, Komboti or Tillirisimo; though the carob trees of Tilliria are considered to produce the best quality fruit with high sugar content, palatable and of better commercial value.

USES OF CAROBS.

As an item of diet the carob is used in the raw state and owing to the sugar it contains it is palatable and nourishing. It is eaten in all the eastern countries but not in any considerable quantities.

Carob Syrup.—This is made by grinding the carob pods to the size of a wheat grain and washing the meal in a basket by pouring water on top of it until the draining water contains no more sugar. The sugary water is boiled until it is concentrated to the thickness of bee's honey. This substance is marketed as carob syrup or carob honey. It is used as a substitute for honey or sugar. By further concentrating and processing a thick carob paste (*pastelli*) is obtained which at one time was consumed in considerable quantities by children during winter months, but now practically out of demand.

As Animal Food.—Owing to its agreeable smell, taste and flavour carob is eaten by all animals with good appetite and as it is rich in sugar it is a heat producing food. It is poor in protein and cannot form by itself the concentrate portion of a ration. In the following table the principal food constituents of carob is given and for the sake of ready comparison the analysis of barley, oats and maize are added. The figures are taken from Wery's "Agenda Agricole" and they compare well with the figures given in the table compiled by Dr. Crowther and published in "The Science and Practice of British Farming" by Watson and More.

	<i>Carob (locust bean)</i>		<i>Barley</i>		<i>Oats</i>		<i>Maize.</i>	
	per cent.		per cent.		per cent.		per cent.	
Dry matter..	85.0	..	85.7	..	86.7	..	87.0	
Digestible protein ..	4.0	..	6.6	..	8.0	..	7.1	
Fats and oils ..	0.7	..	1.9	..	4.0	..	3.9	
Nitrogen free extract	65.5	..	62.4	..	44.8	..	65.7	
Cellulose (fibre) ..	3.7	..	1.3	..	2.6	..	1.3	
Starch equivalent ..	71.7	..	72.0	..	59.7	..	81.5	

An analysis of the figures given in the above table indicates that the food value of the carob is the poorer of the four and although carbohydrate figure compares well the carob is poor in protein (nitrogen) and in oils. Therefore, if carobs can be obtained much cheaper than the other three stuffs it may be used liberally as food provided the deficiencies are made good by addition of other concentrates rich in protein or prepared in the form of suitable food mixture by mixing with barley or oats. Carob is used either kibbled or in the meal form. The following quantities may be mixed into the grain rations of various animals :—

Horses	1 oke carob meal per day.
Milk cows	1½ " "
Calves 6 months	0½ " "
Pigs	0¼ " "

Most of the carobs produced in Cyprus are exported, principally to United Kingdom, where it is used as one of the ingredients in the mixture of a feeding cake. Formerly it was exported as whole carobs but lately

carob crushing mills are established in the Island and it is now exported as carob meal, or kibbled carobs. In Cyprus the quantity of carobs used for feeding to stock is negligible, perhaps not more than 1,000 tons, whereas the normal annual average of production is more than 40,000 tons.

Industrial Uses.—The fact that carobs contain sugar in an appreciable proportion has suggested its use as raw material for preparing sugar and alcohol, but none of these have so far been developed beyond experimental stages. There is probably more scope for its utilization in the preparation of alcohol.

Use of Carob Seeds.—During the last fifteen years preparations from carob seeds have developed industrially and now it forms an important raw material in preparation of certain gums for sizing textile products and manufacture of toilet preparations.

Uses of Carob Wood.—The carob tree is not considered as a suitable tree to supply timber for various uses. Only small sized timber can be obtained which are used in cart and cabinet making. For fuel, however, carob wood is very good. It is hard and heavy and has good calorific value as compared with several other woods used as fuel. It is also burnt into charcoal but the product although it burns readily emits undesirable sparks.

Carob Tree on the Road-side.—In countries suitable to its growth the carob tree is a very useful avenue tree. With its dense ever green, foliage it makes a desirable shade tree on the roads and rightly deserves more attention for this purpose.

Some Literature on the Carob Tree :—

P. Gennadius, *The Carob Tree.*

Cyprus Gazette.—"Agricultural Supplement": *Carobs, the Consol of Cyprus.*

E. Sanvaigso, *Les culture sur le littoral de la Méditerranée.*

Ch. Pelaghias, *Le caroubier et la caroube.*

M. Schwartzman, *The Carob Tree and its Cultivation in Palestine.*



Publications Reviewed.

BULLETINS ON SEED PRODUCTION OF HERBAGE AND FORAGE PLANTS.

A SERIES of six bulletins dealing with questions relating to the production of seed of herbage and forage species has recently been issued by the Imperial Bureau of Plant Genetics (Herbage Plants), Aberystwyth.

Bulletins Nos. 19 and 23 deal with the production of grass seed and leguminous seed respectively. In each instance the publication consists of, as indicated in the title page "An International Exchange of Opinions and Experiences on the Technique of producing Seed of Gramineous and Leguminous Herbage and Forage Plants."

Each contributor describes in some detail the distribution soil types, methods and sowing, cultivation and harvesting of one or other of the crops in which he has specialized. Both Bulletins cover a wide range of crops and contain much valuable experience gained under diverse conditions obtaining in many widely separated countries which include the British Isles, N. Europe, New Zealand, Australia, the U.S.A. and India. (The article on "The Cultivation for Seed and Fodder of 'Bersim' in India" is perhaps of special interest to Cyprus readers, as a supplementary forage crop in irrigated areas, in view of its extensive use in the neighbouring country of Egypt.)

Bulletin 21 deals with the influence of climatic conditions of "Type Composition" and draws a tension to the danger of an alteration of the type of strain grown away from their special growing areas and emphasizes the necessity of keeping commercial seed distinct from the "Elite" seed from the propagating station. First class commercial seed must always be raised direct from the seed supplied from the breeding station.

Bulletin 24 deals mainly with the varieties and the technique of harvesting grasses used by the U.S.A. Soil Conservation Service to combat soil erosion.

Bulletin 22 is a well-illustrated and concise account of the whole technique grass seed production evolved at the Welsh Plant Breeding Station and deals in detail with the methods employed from the first isolation of a strain to the production of commercial quantities of seed.

Bulletin 20 is a valuable summary of the pests attacking herbage and forage crops grown for seed and the measures which can be taken to control them. The author, Dr. Barnes of Rothamsted, stresses the necessity of active co-operation between the grower, agronomist and entomologist, so that the measures indicated can be carried out, as far as possible, without interference with the usual cultural practices.

Copies of the Bulletins are obtainable from the Chief Officer, Imperial Bureau for Herbage Plants, Aberystwyth.

R.M.N.

Sericultural Notes.

HIBERNATION OF SILKWORM EGGS.

THE same house at Pedhoulas which was used last season has again been rented for this year by the Agricultural Department for the natural hibernation of all locally-produced and imported silkworm eggs, where they will be under the supervision of the Agricultural Assistant stationed at Kalopanayiotis.

All locally-produced and imported eggs are required to remain at this hibernation station from 5th January to 20th February.

ISSUE OF MULBERRY PLANTS FREE OF CHARGE.

The Agricultural Department has again arranged for the free issue of mulberry trees from the Nursery and School Gardens for this season to farmers interested.

Farmers desirous of taking advantage of this offer should apply to the nearest Agricultural Station.

AGRICULTURAL COLLEGE OLD STUDENTS' CLUB CUP FOR THE BEST DEMONSTRATION SILKWORM REARING IN A GIRLS' SCHOOL.

The Acting Director of Agriculture visited the village of Ayios Amvrosios (Kyrenia District) on the 15th November, 1937, and presented the Agricultural College Old Students' Club Cup and a replica to the Schoolmistress, Miss Corallia Economidhou, who obtained the highest production of cocoons in the Girls' School demonstrations in 1937 (78 okes and 96 drams per ounce of eggs).

COMPARATIVE STATEMENT SHOWING THE QUANTITY OF SILKWORM EGGS HATCHED OUT AND REARED DURING THE YEARS 1934-1937.

District	1934	1935	1936	1937
	OZS.	OZS.	OZS.	OZS.
Nicosia ..	710	858	820	854
Larnaca ..	271	249	230	230
Limassol ..	179	138	170	214
Famagusta ..	1,130	985	1,023	1,075
Paphos ..	1,269	800	750	816
Kyrenia ..	1,026	940	1,098	1,107
Total ..	4,585	3,970	4,091	4,296

The following table shows the quantity of silk cocoons and silk produced in 1937, as shown in Agricultural Officers' reports:

District	Cocoons purchased by merchants	Cocoons used for egg production	Cocoons spun into thread	Cocoons reeled	Silk produced	Total production of cocoons
	okes	okes	okes	okes	okes	okes
Nicosia ..	2,500	839	1,100	15,561	1,680	20,000
Larnaca ..	630	—	910	5,360	670	6,900
Limassol ..	540	—	60	4,900	800	5,500
Famagusta ..	1,400	83	1,900	18,547	2,305	22,030
Paphos ..	11,100	310	2,100	6,500	783	20,010
Kyrenia ..	14,000	—	800	16,000	1,800	30,800
Total ..	30,170	1,232	6,970	66,868	8,038	105,240

Livestock Notes.

EXCELLENT rains have fallen in most parts of the Island in October and November and grass is now growing and is providing keep for the flocks, and should provide plenty of grazing in a short while. Stock are consequently in good condition and lambing has begun under most favourable conditions. For cows, however, there is not much grazing and now is the time when hay is most useful as green lucerne and maize is getting scarce and other green food (barley, etc.), is hardly ready.

Horse and Mule Breeding.—Nine more British Army mares have been acquired by the Government from Egypt but unfortunately one died soon after arrival from injuries sustained during the crossing. Seven of the remainder will be issued on loan.

An auction sale, chiefly of horses and mules was held at Athalassa on 5th November. Bidding was keen and the prices realized were very satisfactory, the average prices being as follows :—

	£	s.	p.
5 mares and fillies averaged	14	4	0
2 colts (6 months old) averaged	7	8	0
7 mules (including foals) averaged	14	6	0
2 cows averaged	12	5	0
2 ewes averaged	2	10	0

Famagusta Stud Stables.—It has been decided in view of the fact that these stables have not for some time been made full use of, to close them down indefinitely. A stallion is now stationed on loan at Akhna which should be sufficient for the needs of that area, but none of the other stud animals are required at Famagusta.

Poultry Notes.

THERE has recently been a greatly increased interest in and demand for poultry and in spite of an expansion last year in the poultry branch at the Government Stock Farm it is quite impossible to meet the present demand for hatching eggs, chicks, pullets and cockerels.

Egg production is lowest in the autumn, and prices have risen lately to as much as 1s. per dozen, and to meet this shortage greater efforts should be made to hatch chicks in December and January so that they will begin laying by October.

On the Government Stock Farm pullets hatched in November to December last year began laying in June and are now laying well. One pullet has laid 93 eggs in 5 months.

Trap-nesting records were begun a year ago and in twelve months the following figures have been obtained for the different breeds :—

Rhode Island Red averaged 150 eggs per bird.

White Leghorn ,, 139 ,,

Light Sussex ,, 131 ,,

In addition a pen of crossbred (L.S.X. Native) hens have averaged 123 eggs in nine months which compares very well with the purebred birds. A scheme for fostering the improvement of native breeds was begun last year and continued this year, whereby cockerels, chiefly of the R.I.R. breed, are sold to selected villagers for 1s. on the explicit understanding that they are used for breeding in place of the ordinary native cockerels. Good results are being achieved in Dhali and Kiti, the two villages chosen last year, where large numbers of crossbred chicks resembling the R.I.R. in colour can be seen.

It is hoped to still further increase the number available for distribution next year, and also to have more hatching eggs and chicks for sale.

Meteorological Data, Cyprus.

SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS.

SEPTEMBER, 1937.

District and Station	Shade temperature			Rainfall			
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	94.67	65.50	0.02	1	0.02	0.28	
Athalassa	—	—	—	—	—	0.64	
Morphou	89.60	46.40	—	—	—	0.18	
Makheras	—	—	—	—	—	0.20	
<i>Famagusta District :</i>							
Famagusta	95.75	67.83	—	—	—	0.22	
Akhyritou	92.60	67.40	—	—	—	0.18	—
Rizokarpaso	—	—	—	—	—	0.28	
Lefkoniko	—	—	—	—	—	0.47	
<i>Larnaca District :</i>							
Larnaca	89.93	66.00	—	—	—	0.48	
Lefkara	—	—	—	—	—	0.65	
<i>Limassol District :</i>							
Limassol	90.00	65.53	—	—	—	0.03	—
Saittas	—	—	1.45	2	0.75	0.99	
Trikoukkia	79.67	66.53	1.17	3	0.85	1.01	
Alekhthora	—	—	—	—	—	0.15	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	0.16	—
Polis	—	—	—	—	—	0.35	—
<i>Kyrenia District :</i>							
Kyrenia	86.20	70.00	—	—	—	0.30	—

Note.—Compiled from returns furnished by Public Works Department.

OCTOBER, 1937.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	83.55	57.87	0.97	8	0.33	0.46	—
Athalassa	—	—	1.40	4	0.97	0.59	—
Morphou	83.45	57.90	0.78	5	0.41	0.35	—
Makhæras	—	—	1.30	4	0.60	0.88	—
<i>Famagusta District :</i>							
Famagusta	87.45	61.03	5.14	7	1.50	1.30	—
Akhyritou	82.16	58.03	3.28	7	1.03	0.91	—
Rizokarpaso	—	—	1.85	5	0.50	0.94	—
Lefkoniko	—	—	0.60	4	0.27	0.34	—
<i>Larnaca District :</i>							
Larnaca	80.84	60.68	0.78	3	0.46	0.74	—
Lefkara	—	—	2.66	3	2.10	1.13	—
<i>Limassol District :</i>							
Limassol	83.97	61.42	0.82	5	0.46	0.88	—
Saittas	—	—	3.69	9	1.50	1.06	—
Trikoukkia	64.57	47.00	6.55	10	1.60	2.44	—
Alekhtora	—	—	1.64	5	0.94	0.83	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	0.73	—
Polis... ..	—	—	1.27	6	0.45	1.16	—
<i>Kyrenia District :</i>							
Kyrenia	80.35	64.23	2.17	9	0.90	0.87	—

NOVEMBER, 1937.

<i>Nicosia District :</i>							
Nicosia	72.93	51.77	2.79	11	0.85	1.11	—
Athalassa	—	—	2.48	12	0.50	0.91	—
Morphou	73.53	54.03	2.12	7	0.63	0.90	—
Makhæras	—	—	6.32	9	1.50	2.07	—
<i>Famagusta District :</i>							
Famagusta	76.53	56.83	2.61	8	1.03	1.71	—
Akhyritou	73.63	52.57	1.14	7	0.44	1.30	—
Rizokarpaso	—	—	6.79	8	2.50	2.56	—
Lefkoniko	—	—	3.30	10	1.05	1.25	—
<i>Larnaca District :</i>							
Larnaca	73.30	54.97	2.30	8	0.90	1.61	—
Lefkara	—	—	4.09	10	1.00	2.56	—
<i>Limassol District :</i>							
Limassol	75.47	56.83	3.50	8	0.84	1.86	—
Saittas	—	—	4.00	8	1.05	1.50	—
Trikoukkia	58.48	42.52	5.25	8	1.10	1.89	—
Alekhtora	—	—	4.05	8	1.30	1.98	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	1.94	—
Polis... ..	—	—	2.39	6	0.70	1.64	—
<i>Kyrenia District :</i>							
Kyrenia	72.70	59.23	3.19	12	1.70	2.68	—

Note.—Compiled from returns furnished by Public Works Department.

EDITORIAL AND ADVERTISEMENT NOTICES

All communications for publication should be addressed to the Editor, *Cyprus Agricultural Journal*, Department of Agriculture Nicosia.

Contributions are invited, written on one side of the paper only. It should be understood that unaccepted manuscripts can not be returned unless postage is prepaid.

Copies of the *Cyprus Agricultural Journal* can be obtained on application to the Department of Agriculture, price 3*p.* per number, or by post 4*p.*

Annual subscription payable in advance 16*p.* post free. Overseas subscription 18*p.* (2/-).

SCALE OF ADVERTISEMENT CHARGES.

A special reduced rate is charged for all advertisements inserted. As the Journal is circulated throughout the Colony and copies are sent to all Colonies Overseas it may be regarded as a valuable medium for advertising.

The following are the rates in force :—

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For Wants, Articles for Sale or Exchange, Notices of Meetings, Events, etc., for the first 16 words, 2*s.* Exceeding 16 words but not exceeding 32 words, 4*s.* For every additional 8 words 6*p.*

Advertisements should be written on one side of the paper only, and should reach the Editor, *Cyprus Agricultural Journal*, not later than the 10th of the month of issue.

The "*Cyprus Agricultural Journal*" is published in March, June September and December.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

The Horse Breeding Law, 1930.

LIST OF STALLIONS LICENSED FOR 1937.

NICOSIA DISTRICT.

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Akaki	..	Michael Th. Rafti	..	29
do.	..	Elias M. Tsinga	..	203
Argaki	..	Polyvios Theophani	..	153
Astromeritis	..	Christoforos Evangeli	..	26
Elea	..	Rejeb Ahmed	..	254
Kalokhorio	..	Yioryis Papaconstantinou	..	262
Lefka	..	Yiangos G. Boyiadji	..	20
Louroujina	..	Mehmed Youssouf Mukhtar	..	22
Lymbia	..	Andronikos Petri	..	32
do.	..	Kyr. Constantinou	..	33
Mammari	..	Nicolas Haji Haralambou	..	206
Morphou	..	Vasilis T. Spanos	..	18
do.	..	Andreas Ahapittas	..	249
Nicosia	..	Hussein Mustafa Kerim	..	117
Philia	..	Towlis Haralambou	..	255
Yeri	..	Yeoryos Petri	..	16
Yerolakkos	..	Haralambos Sophokli	..	194
do.	..	Hj. Michael Hj. Loi	..	35

LARNACA DISTRICT.

Alaminos	..	Rifat Jumaa	..	260
do.	..	Salih Jumaa	..	64
Aradhippou	..	Costis Kyriakou	..	15
do.	..	Lefteris Towli	..	225
do.	..	Andreas Gregori Orphanou	..	277
Athienou	..	Haris Antoni	..	66
do.	..	Costas N. Haji Vrashimi	..	96
do.	..	Vasilis M. Phiakou	..	159
do.	..	Nicolas Vassili Yiancou	..	276
Kophinou	..	Hussein Handji Ibrahim	..	209
Larnaca	..	Vasilis Demetri	..	43
Voroklini	..	Panayis Theodosi	..	106
do.	..	Panayis Vasiliou Lazari	..	220

FAMAGUSTA DISTRICT.

Akanthou	..	Yiannis Hambi	..	270
Asha	..	Antonis Michael	..	92
do.	..	Demetris Kounallis	..	208
do.	..	Christos Haji Lavithi	..	234
do.	..	Kyriakos Antoni	..	239
do.	..	Elengou Prokopi	..	274

<i>Village</i>	<i>Owner's name</i>	<i>Reg. No.</i>
Ayios Andronikos ..	Spyros Yeoryi ..	65
do. ..	Christofis Hambi ..	240
Ayios Elias ..	Constantis Stylli ..	246
do. ..	Yeorgios Christodoulou ..	265
Ayios Seryios ..	Antonis S. Gizas ..	68
Ephtakomi ..	Loizos Hambaka ..	219
Galatia ..	Akil Mustafa Gonie ..	54
Kalopsidha ..	Yeoryios Antoniou ..	267
Kondea ..	Christos Hanni ..	259
Lefkoniko ..	Mehmed Salih ..	38
do. ..	Christos Haji Symeou ..	41
Leonarisso ..	Chrysanthos Panayi ..	56
do. ..	Mich. Michaelides ..	278
Lysi ..	Minas Lysandrou ..	80
do. ..	Artemis Haji Constandoura ..	227
Marathovouno ..	Panayiotis K. Panatgia ..	62
Melanagra ..	Kallis Kyriakou ..	60
Milea ..	Loizos Panayi ..	257
Do. ..	Sotira Panayi ..	193
Ovgoros ..	Djafer Emin A. M. Mustafa ..	213
Paralimni ..	Andreas K. Xiouri ..	72
do. ..	Evangelis Haji Vraha ..	172
do. ..	Nicolas G. Tsiakouras ..	210
do. ..	Demetris A. Maouris ..	244
do. ..	Avraamis Anastasi ..	258
Peristeronopiyi ..	Andreas Louka ..	45
do. ..	Const. K. Haji Yeoryi ..	73
Phrenaros ..	Kyriakos Theori ..	71
do. ..	Adamos Haji Theori ..	226
Rizokarpaso ..	Panayiotis K. Sakka ..	171
do. ..	Christofis N. Koulia ..	241
do. ..	Pandelis N. Haji Hari ..	281
Sotira ..	Vasilis Demetri ..	252
Styllos ..	Annezou Nikou ..	269
do. ..	Kyriakos G. Voskou ..	282
Trikomo ..	Marikou Kyriakou ..	224
do. ..	Kyprianos Stylli Haili ..	266
do. ..	Eleni Philippou Pieri ..	279
Vatili ..	Andreas G. Iona ..	86
do. ..	Vasiliki Haji Christodoulou ..	89
Yialousa ..	Christofis Panayi Pitchi ..	280

LIMASSOL DISTRICT.

Anoyira ..	Thoukis Solomi ..	143
Asgata ..	Demosth. Evangeli ..	119
Ay. Phyla ..	Costis P. Silikiotis ..	118

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Episkopi	..	Bairam Mehmed	..	131
Limassol	..	Mehmed Mustafa	..	40
Pakhna	..	Theodoros Evgeniou	..	121
do.	..	Haralambos M. Kais	..	283
Phasoula	..	Nicolas Evangelis	..	272

PAPHOS DISTRICT.

Amarketi	..	Mulla A. M. Mustafa	..	125
Dhrousa	..	Yiannis Sava	..	139
Kissonerga	..	Evangelis Haji Nicola	..	126
do.	..	Haji Towlis Haralambou	..	129
Kouklia	..	Mehmed Hassan Kokkinos	..	215
Ktima	..	Veli Tselebis	..	127
Kelokedhara	..	G. Christodoulou Sirimis	..	275
Lapithiou	..	Mehmed Mulla Osman	..	263
Lasa	..	Yeoryios Ch. Ellinas	..	130
Pano Arodhes	..	Harilaos Nicolaou	..	136
do.	..	Chrysost. Panayiotou	..	214
Peristerona	..	Solomon Haralambou	..	230
Prodromi	..	Avraamis Sava	..	248
Stroumbi	..	Sofoklis Constanti	..	178
Terra	..	Mustafa Yusuf	..	141

KYRENIA DISTRICT.

Agri dhaki	..	Haralambos Yianni	..	147
Asomatos	..	Christallou Michaeli	..	146
do.	..	Antonis Haji I. Hanni	..	150
Ayios Amvrosios	..	Nicolas Haji Demetri	..	256
Ayios Ermolaos	..	Efstathios Christofi	..	166
Ayios Yeoryios	..	Costis N. Spanou	..	157
Bellapais	..	Savas K. D. Jirkaji	..	161
do.	..	Savas K. Demetriades	..	236
Dhiorios	..	Gregoris Haji Michael	..	148
Dhikomo, Kato	..	Loukas G. Loukaides	..	273
Kyrenia	..	Shakir Hussein	..	158
Lapithos	..	Polyk. Panayioti	..	99
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Myrtou	..	Cleov. Stylianou	..	149
Siaklipos	..	Lavithis Demetriou	..	232

11th December, 1937.

ROBERT J. ROE,
*Chief Veterinary Officer,
 Inspector of Horse Breeding.*

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Manager, Stock Farm, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Officer in Charge of the Farm.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, including the Nursery Garden, Nicosia, and Officers are stationed at Kythrea, Dheftera and Morphou.

Lefka Sub-District.—Agricultural Officer, Ibrahim Hakki Effendi, is in charge, including Pyrgos area.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA AND LIMASSOL DISTRICTS.

Agricultural Officer, Mr. M. Papaiacovou, is in charge including Larnaca Nursery Garden. Officers are stationed at Larnaca, Skarinou, Nisou, Agros and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Kyprianides, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klockkaris, is in charge. Paphos District includes Paphos and Polis Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelo-kedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant.

Table Showing Distribution of Stud Animals at the Stud Stables and Government Stock Farm, Athalassa on 1st July, 1937.

<i>Station</i>	<i>Stallion</i>	<i>Donkey</i>	<i>Bull</i>	<i>Breed of Bull</i>
Nicosia ..	—	—	Minstrel	Shorthorn
Athalassa ..	Waterkoscie ..	No. 42 ..	Ambassador	Shorthorn
	Kildare Guard ..	No. 38 ..	Monarch ..	Kerry
	Life Line ..	No. 47 ..	No. 469 ..	Cyprus
Ay. Theodoros	Pitchford ..	No. 50 ..	No. 461 ..	Cyprus
Larnaca ..	Friars Flutter..	No. 52 ..	No. 462 ..	Cross-bred
Lefkoniko ..	Marcher Lord..	No. 48 ..	No. 443 ..	Cyprus
Morphou ..	—	No. 55 ..	No. 468 ..	Cyprus
Ktima ..	—	No. 41 ..	No. 454 ..	Kerry
Polis ..	Sonny Boy ..	No. 49 ..	No. 451 ..	Kerry
Rizokarpaso..	—	No. 54 ..	No. 460 ..	Cyprus
Vatili ..	Corby Bridge..	No. 56 ..	No. 458 ..	Cyprus
			No. 488 ..	Shorthorn

Notes : 1.—There are Boars at all the above stations except Vatili, Nicosia and Morphou and he-goats at all stations except Vatili and Morphou; there is a pen of R.I.R. poultry at Larnaca, Vatili, Lefkoniko and Ayios Theodoros Stud Stables.

2.—Boars and he-goats may be issued on loan to *bona fide* applicants upon application to the Director of Agriculture or Manager, Stock Farm, Athalassa.

FOREST DEPARTMENT OF CYPRUS

Headquarters.—NICOSIA.

FOREST DIVISIONS :—

1. Northern Range Division, with Headquarters at Halefka
2. Troödos Division, with Headquarters at Platania.
3. Paphos Division, with Headquarters at Stavros.

NORTHERN RANGE DIVISION :

Main Forests : Ayia Irini, Dhiorios, Kormakiti, Korphi, Kornos, Lapithos-Karavas, Karmi, Kyrenia Road Block, Bellapais-Dhikomo, Buffavento, Kythrea, Plataniotissa east and west, Pentadactylos, Kartaldagh, Trakhoni, Kharcha, Pernarotos, Boro or Khamilon, Pittaroula, Melandryna, Mavro Oros, Kantara, Dennarka, Yiouti, Aetopetra, Sheromilia, Peristeria, Akrades, Kavallis, Karpas, Eleousa, Halasta, Apostolos Andreas, Salamis and Fresh Water Lake plantations.

Enquiries concerning forest matters, sale of standing trees, plants, etc., should be addressed to the Assistant Conservator of Forests, Northern Range Division, Halefka Forest Station, *via* Kythrea.

TROÖDOS DIVISION :

Main Forests : Troödos and outlying-blocks, Adelphi and outlying blocks, Limassol and outlying blocks, Makheras, Aetomoutti, Stavrovouni, Episkopi, Paramali, Akrotiri, Limassol plantations and Korno Plantation.

Enquiries concerning forest matters, sale of standing trees, plants, etc., should be addressed to the Assistant Conservator of Forests, Troödos Division, Platania Forest Station.

PAPHOS DIVISION :

Main Forests : Paphos, Akamas, Randi and Orites forests

Enquiries concerning forest matters, sale of standing trees, plants, etc., should be addressed to the Assistant Conservator of Forests, Paphos Division, Stavros tis Psokas Forest Station.

AREAS UNDER THE DIRECT CHARGE OF THE CONSERVATOR OF FORESTS :

The plantations round Nicosia, Athalassa and Larnaca District.

Enquiries concerning forest matters, sale of standing trees, plants, etc., should be addressed to the Conservator of Forests, Nicosia.

**THE
CYPRUS
AGRICULTURAL JOURNAL**

1938

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Planting Potatoes, Akhna Village, Famagusta District.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW

OF THE

AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

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EDITORIAL NOTES

RAINS were abundant in all districts during January and the month of February was unusually wet with very cold spells. The cold damp weather has somewhat retarded the growth of cereals, particularly wheat. If normal climatic conditions prevail during harvest and there is no abnormal incidence of rust, the prospects for a good harvest are high.

* * * * *

VISIT OF HER ROYAL HIGHNESS THE PRINCESS ROYAL AND THE EARL OF HAREWOOD.

The Department of Agriculture was honoured by no less than three visits to various centres of its activities during the stay of Her Royal Highness the Princess Royal and the Right Honourable the Earl of Harewood in Cyprus in February.

On Friday the 18th. Her Royal Highness, accompanied by Lady Palmer, paid a visit to the Nicosia Public Garden and Nurseries, when the Director had the honour of being presented to the Princess. During a tour of the gardens Mr. Maratheftis, the Agricultural Officer in Charge, acted very ably as guide and pointed out the principal trees and plants of interest to Her Royal Highness, who gave many evidences of her extensive botanical knowledge.

On the following day, the Director had the pleasure of conducting, both the distinguished visitors round the Central Experiment Farm, Morphou. The work of the Station was explained to them and they were shown round the farm buildings and the nurseries. They were interested, amongst other things, in the contrast between the Cyprus plough and the more modern implements employed at the farm and asked questions concerning the budding of citrus and olives in the nurseries. As they left Mr. Koumides presented a bouquet of flowers to Her Royal Highness and answered her enquiry as to the identity of some of them.

On Friday, 25th February, His Excellency the Governor accompanied Earl Harewood on a visit to the Stock Farm at Athalassa and the visitors spent over an hour making a tour of the farm with the Director and the Manager, Mr. Maule. The latter explained the purpose of the various branches of the farm's activities and demonstrated the work in progress. Earl Harewood evinced the keenest interest in what he saw and showed a wide personal knowledge of all aspects of animal husbandry. The only thing, in fact, which really appeared to be new to him was the milking of the sheep!

These visits by Her Royal Highness and Earl Harewood were very greatly appreciated by all ranks of the Department and the interest which they took will doubtless serve as a source of inspiration for the future.

* * * * *

ARBOR DAY CELEBRATIONS, 1938.

The seventeenth Arbor Day at village schools was celebrated by Moslem students on Friday, 28th January, 1938, and by Greek students, on Sunday, 30th January, 1938. An Officer of the Agricultural, Forest or Education Departments attended the celebrations at the more important villages and the necessary seedlings were supplied free of charge from School Gardens or Nursery Gardens.

* * * * *

LARNACA POULTRY SHOW.

The second Cyprus Poultry Show was held at St. George's Monastery near Larnaca on the 19th December, 1937. The Show which was opened by His Excellency the Governor was well attended. Owing to the keen interest taken in poultry improvement, a special auction sale of poultry from the Government Stock Farm was held at Larnaca on the day of the show and demonstrational exhibits of poultry house and poultry appliances were on view.

* * * * *

FAMAGUSTA ORANGE DAY.

Orange Day Celebrations at Famagusta have been an annual event since 1935. The celebrations this year were held on the 20th February, 1938, and the event was favoured with perfect weather. A full day's programme was prepared and the organization was admirably arranged.

* * * * *

LIMASSOL MUNICIPAL ABATTOIR.

Limassol Municipal Council is to be congratulated on the provision of an up-to-date abattoir which was formally opened by His Excellency the Governor in the presence of a large number of Limassol citizens on the 12th January, 1938. The premises were constructed by Mr. Nicos Roussos, Municipal Engineer, in accordance with general designs prepared by Mr. R. J. Roe, Chief Veterinary Officer, and consist of adequate lairages, slaughter and preparation halls, offal rooms, butchers' rooms, boiler house and offices. The pig department is a separate and self-contained unit. Full facilities are provided for the inspection of the animals before and after slaughter and for the handling of the meat in a hygienic manner.

* * * * *

AGRICULTURAL ADVISORY COMMITTEE.

The constitution of the Agricultural Advisory Committee for the year 1938 is: Chairman, the Director of Agriculture; Official Members: The Registrar, Co-operative Credit Societies and the Superintendent of Agriculture; Non-official Members: Mr. Paul George Pavlides, Limassol, Mr. P. Ioannou, Famagusta, Mr. N. Nicolaides, Paphos, Mr. Stavros Stavrides, Ayios Epiktitos (Kyrenia), Mr. Ch. N. Ashiotis, Tymbou (Nicosia), Mr. Tewfik Saade, Larnaca and Mehmed Mulla Halil Eff., Knodhara (Famagusta).

RURAL DEVELOPMENT SCHEME.

Mr. J. Christodoulou and Mr. Omiros Loizides, Agricultural Assistants, have been seconded as Assistant District Inspectors, Nicosia and Paphos Districts respectively, while acting as local representatives of the scheme.

The areas approved by Government consist of the villages of Peristerona, Orounda, Akaki, Meniko, Avlona, Dhenia, Kokkini Trimithia, Mammari, Paleometokho and Ayii Trimithias in Nicosia District, and Ayios Nicolaos, Philousa, Pretori, Kidhares, Kithasi, Salamiou, Mesana, Arminou, Malounda and Ayios Ioannis in Paphos District.

The scheme embraces matters relating to public health, sanitation, co-operation and education as well as agriculture and will be operated under the aegis of the District Administration. The aims are to make more intensive use of the services already provided by Government and assisting the rural population to help itself.

* * * * *

SILKWORM EGG PRODUCTION.

The quantity of silkworm eggs available for the 1938 sericultural season is 5,712 ounces, of which 4,512 ounces were produced locally and 1,200 ounces were imported.

All the silkworm eggs, both locally produced and imported, were hibernated at Pedhoulas under the control of the Agricultural Department as in previous years.

SERICULTURAL STATION, KALOPANAYIOTIS.

A quantity of 103½ ounces (829 drams) of selected silkworm eggs of different races, three of which were imported in 1937, was produced in the Agricultural Department's Sericultural Station at Kalopanayiotis and is available for sale this sericultural season. These eggs will be sold at the usual price of 4½p. per dram (4s. per ounce).

About 140 drams of these silkworm eggs will be issued to girls' schools, free of charge, for demonstration silkworm rearing.

DEMONSTRATION SILKWORM REARINGS IN GIRLS' SCHOOLS.

The usual arrangements have been made for demonstrational silkworm rearings to be carried out this season in 130 girls' schools, the required silkworm eggs being supplied by the Agricultural Department.

The rearings will be carried out by the schoolmistress and the girls of the three upper classes and will be supervised by the officers of the Agricultural Department, who will give the necessary instructions.

Prizes will be awarded to schoolmistresses as last year: £1 for the best demonstration rearing in each district, 10s., for all other satisfactory rearings and the Agricultural College ex-Students' Club Cup and replica to the schoolmistress carrying out the best demonstration rearing.

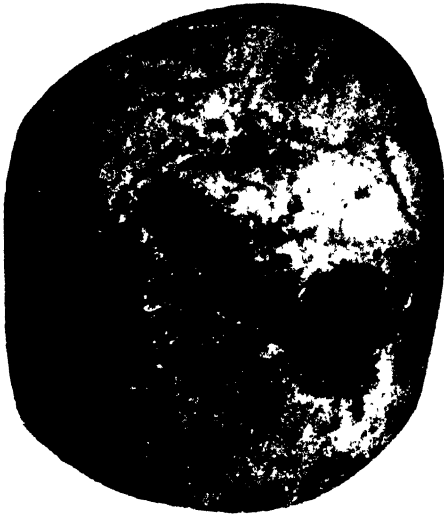
Note on two Diseases of Potato Tubers.

By R. M. NATTRASS, *Plant Pathologist.*

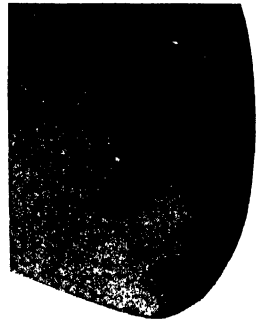
IN most potato-growing countries potato tubers are subject to a number of diseases which mar their appearance, detract from their market value and open the way for the development of rots in transit and storage. Some of these diseases are more or less superficial but cause considerable loss to the consumer, as much of the flesh of the tuber is wasted in peeling. Of such diseases the two best known are the "Common" and "Powdery" scabs. The latter is occasionally seen on imported seed potatoes but climatic conditions in Cyprus do not appear to be favourable to its development. "Common" scab, a less serious disease, occasionally appears on the summer crop.

Diseases affecting the surface of the tubers are of particular importance to Cyprus, in view of the valuable export trade. For local consumption surface diseases may not be very serious but, under conditions of shipment, especially through hot climates, any such diseases greatly increase the possibility of wastage.

Two diseases affecting the tubers have recently made their appearance in the Cyprus crop. Both are sufficiently important to lead to their rejection by the Produce Inspection Service if consigned for shipment.



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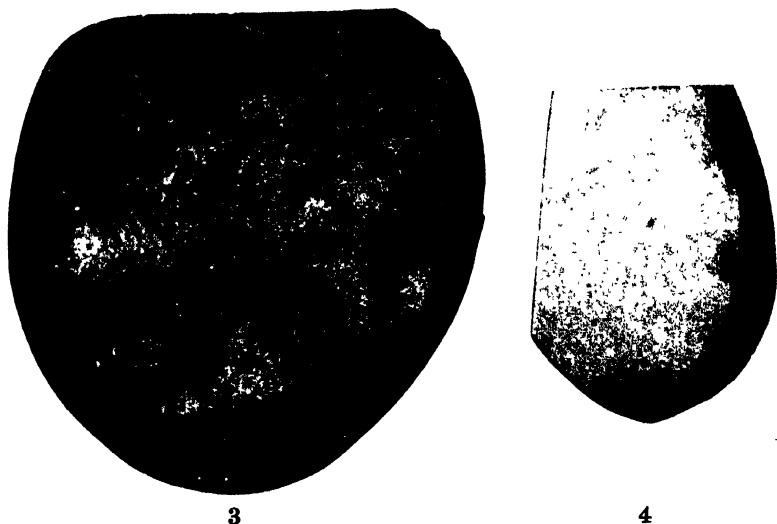
Figs. 1 and 2.—The Alternaria Disease.

1. *Alternaria* Disease.—This disease is caused by the fungus *Alternaria solani* which frequently, in Cyprus, attacks the above ground parts of the potato plant. On the leaves it forms irregular dark brown to black spots which usually show concentric markings. In certain seasons the disease may become severe, blackening the whole of the foliage. Under these conditions spores are produced abundantly and doubtless get washed down into the soil onto the tubers where entry is obtained through wounds or breathing pores.

On the tubers the disease takes the form of shallow depressions or lesions. They are of irregular shape, usually elongated, up to 3 centimetres long and 1 centimetre broad and of a fairly dark brown colour. The outline is usually smooth and undulating. The flesh is sunken to a depth of 2-3 millimetres. Round the margin of the sunken area there is a zone of discoloured tissue. The diseased tissue extends inwards to a depth of up to 1 centimetre and below is bordered by a zone of watersoaked tissue. Occasionally one or more lesions coalesce producing a single large blemish. It is only exceptionally that the skin over the lesion is broken. The illustrations, figures (1) and (2), show the disease on the tubers.

The fungus *Alternaria solani*, identical with that from the leaves, has been isolated from the tuber lesions.

Since the disease on the tubers is caused by spores of the fungus washed down into the soil from the diseased foliage, control measures consist of keeping the foliage free from disease. This can be done by spraying in the early stages with a protective copper fungicide, such as Bordeaux Mixture. When the foliage is severely diseased the crop should be lifted as soon as possible after maturity as the longer it remains in the soil the greater opportunity there will be for the tubers to become infected. It is important that the plants should be kept well ridged up throughout the growing period.



Figs. 3 and 4.—The *Macrophomina* Disease.

2. *Macrophomina* Disease.—This disease, which has recently appeared on Cyprus potatoes, can easily be distinguished from the *Alternaria* disease. In this disease part or all of the surface of the tuber is dotted here and there with small black spots 2-3 millimetres in diameter. In shape they are roughly circular or slightly oval. The centre of each is slightly raised and of a lighter colour than the surrounding tissue. With a lens it can be seen that the skin at this point is broken. The smaller spots have a

hard outline but the outline of the larger spots is somewhat diffuse. Occasionally when the spots are close enough together a larger lesion of indefinite outline is formed.

On cutting into the tuber it will be seen that the diseased tissue does not extend into the flesh as far as the *Alternaria* disease but only to a depth of about 2 millimetres. In the larger spots there is a small air space between the skin and the top of the diseased tissue which becomes black and dry. It will also be seen that the flesh of the tuber after cutting quickly becomes black. Such attacked tubers rapidly develop a rot in storage.

The disease is caused by the fungus *Macrophomina phaseoli* which appears to obtain entry into the tuber through the breathing pores. *M. phaseoli* is a common soil inhabiting fungus in Cyprus and attacks the roots and stems of a number of herbaceous plants including the potato. It does not normally produce spores and is propagated by small bodies about the size of a pin's head. These can be seen in abundance on the roots and stems of attacked plants. These bodies are left in the soil when the plant decays. They are washed through the soil and spread by tools and irrigation water. All wilted plants which may have developed this disease should be uprooted and destroyed when possible. The disease on the tubers is shown on the illustrations (Figs. 3 & 4).

Soil Erosion Demonstrations, 1938.

BY A. PITCAIRN, *Assistant Director of Agriculture.*

THE Department of Agriculture with the approval of His Excellency the Governor has arranged to carry out demonstrations on soil conservation in representative parts of the Island where the need of action is most urgently required. These demonstrational areas have been arranged after consultation with the Commissioner of each District. A plan has been prepared for each area and the Agricultural Officer in Charge of the District has been entrusted to co-operate with the landholders to bring the plan into effect. The demonstrations are designed to explore the avenues through which a general scheme will be evolved later to apply a system of soil conservation in the whole Island.

The following is a brief summary of the objects and methods of demonstrations which have been planned for each area.

AREA No. 1.—A tree planting area declared under the Tree Planting (Village Areas) Laws, 1930 and 1936. This area is free from grazing while declared as a tree planting area.

Objects :

- (1) Planting of parts of the uncultivated bare hills of the watershed with trees.
- (2) Gully control and drainage on the cultivated lands.
- (3) Regeneration of natural pastures on the waste lands.

Method of Application :

- (1) Preparation of contour furrows on the hill slopes to conserve moisture during the early stages of growth of the young trees.
- (2) Organizing the planning of gully control and drainage on the cultivated lands.
- (3) Re-introducing local pasture grasses into the area.

AREA No. 2.—An untterraced locality planted with vines on highly eroding steep slopes.

Objects :

- (1) Demonstrating terracing and cultivation of vines where suitable stone for terrace making is not available.
- (2) Encouragement of tree growing as well as vines.
- (3) Protecting natural drainage streams and water courses in the area.

Methods of Application :

- (1) Selection of a number of plots in the area to carry out experiments of different methods of terracing and cultivation.
- (2) Competitions for the best soil conservation methods practised by the landholders.
- (3) Preparing a plan of the natural drainage system for the landholders and demarcating the limits of cultivation near the streams and drainage beds.

AREA No. 3.—An area in the last stages of erosion caused by excessive fuel cutting and grazing.

Objects :

- (1) Demonstration of terracing cultivated lands.
- (2) Establishment of protective belts of trees and scrub growth.
- (3) Regeneration of natural pastures.

Method of Application :

Co-operation with the landholders in preparing inexpensive terraces and stone walls provided grazing is controlled to allow the establishment of belts of trees on the ridges and regeneration of natural pastures.

AREA No. 4.—A village area in the central Mesaoria in which all the village lands are under cultivation.

Objects :

- (1) Prevention of gullying in the valleys.
- (2) Control of "run off" from the slopes.
- (3) Creation of fuel reserves.

Methods of Application :

- (1) Planting of protective rows of reeds to form terraces in the low lying valleys.
- (2) Construction of low earth terraces to check "run off" on the sloping fallow lands.
- (3) Encouragement of tree planting especially olive trees on the boundaries of cultivated fields and forest trees as fuel reserves on the poor lands.

AREA No. 5.—The Rural Development Scheme area:

Objects :

To co-operate with the executive officer in charge of the rural development scheme in applying an organized system of soil conservation in an area covering the village lands of a group of six villages.

The carrying out of the above demonstrations requires a certain amount of expenditure, but the funds provided are not intended to give financial assistance to landholders in the areas selected. Any expenditure on the demonstrations will be in the nature of indirect assistance with a view to stimulating the activity of landholders and village authorities in taking measures on their own initiative.

Diseases of Cereals—IV.

By R. M. NATTRASS, *Plant Pathologist.*

LEAF SPOT OF BARLEY.

The "Leaf Spot" or "Net Blotch" disease of barley is one of the most widespread of the cereal disease in Cyprus. It appears to a greater or less extent, in the winter and early spring, on nearly all barley crops and is usually noticed when the plants are from 4-10 inches high.



Fig. 1.—Young Barley Plant showing primary infection of Leaf Spot (*Helminthosporium teres*).

The first appearance of the disease on the crop is in the form of small dark brown circular or irregularly shaped spots one to two millimetres in diameter. These spots later increase in size and become oblong or elongated with an irregular outline and may, on green leaves, be bordered by a yellow margin. In later stages the spots become paler in colour and intersected by a network of darker brown tissue from which the name "Net Blotch" is given. The larger spots may extend the entire width of the leaf blade and not infrequently cause it to bend down at this point. When the spots are very numerous a weakening of the plant occurs, a yellowing of the leaves ensues and the lower leaves may dry up. The disease is caused by a microscopic fungus *Helminthosporium teres** and originates from seed which has become contaminated with spores of the fungus before being sown.

These spores infect the seedling with the fungus which, for a time, grows in the plant tissues, eventually producing the brown spots which are so frequently seen on the young plants. It will be observed that this stage of the disease does not usually occur in patches but that a whole field is equally attacked. This constitutes the "Primary" infection; if weather conditions are unfavourable to further development of the fungus the later formed leaves of the plant are free.



Fig. 2.—Leaf of Barley showing lesions of Leaf Spot (*Helminthosporium teres*) $\times 3$ approx.

Under suitable conditions, however, these primary spots may bear spores of the fungus which, when blown or carried on to healthy leaves, produce a secondary infection and may cause a rapid spread of the disease from plant to plant. This stage of the disease may persist on the plant until maturity is reached, all the leaves of the plant being affected. At this stage, which is more uncommon, reduction of the yield occurs.

Occasionally the seedlings from contaminated seed may be so severely affected that they die down soon after they have appeared.

Two types of attack, therefore, may occur, a primary attack from infected seed, which usually appears spontaneously on the whole field, and a secondary later attack which arises from the spores derived from the primarily attacked seedlings, or may even be carried on to the plants from a neighbouring attacked crop.

* "Leaf Spot" caused by *Helminthosporium Sativum* has not yet been observed in Cyprus.

Although most of the attacks originate from contaminated seed, infection of the crop may arise from resting bodies of the fungus which have persisted on straw or stubble of a preceding crop.

The control of this disease is best effected by treatment of the seed with a fungicidal dust such as Agrosan, Ceresan, etc., which at the same time will control the Covered Smut and Stripe Disease. It is not yet known whether the sulphur treatment which is recommended for Covered Smut will also control the Net Blotch.

"Net Blotch" is not considered to be of sufficient importance to warrant seed treatment for this disease alone, as it usually occurs in conjunction with Covered Smut and Leaf Stripe the treatment of the seed with a dust, which will control all three, is well worth while. Copper carbonate is not recommended for the treatment of barley.

It must be remembered that seed treatment will control the primary attack only and that a crop so treated will still be subject to attack from neighbouring fields.

The Apple Tree.

By K. HAMBOULLAS, *Agricultural Assistant.*

HISTORY, ORIGIN AND ITS CULTIVATION IN CYPRUS.

History.—The apple tree has been grown from time immemorial and is perhaps one of the oldest fruit trees on record. Homer, Dioskourides, Theophrastus and many other writers of ancient times have written quite extensively about this tree.

Later on the Romans extended the apple cultivation and several new varieties were established. Plinius, an ancient Roman writer, mentions 25.

The Romans attached such a great importance to this tree that they used to worship their own Goddess the "Pomona," in honour of whom they had an annual festival the "Pomonalia," at which apples and other fruits were offered to the Goddess.

The apples were considered by the Indians as the food of Gods and only kings and very wealthy people could afford to eat this fruit.

At present the apple tree occupies a large proportion of the universal area under fruit trees and is rightly considered as the king of fruits.

Origin.—The apple tree is supposed to have its earliest representatives in the wild crab apple trees which are to be found over large portions of Northern Europe. Some writers consider that the apple tree is indigenous somewhere between Persia and the shores of the Black and Caspian Seas.

Apple Cultivation in Cyprus.—Although no data are available about the cultivation of the apple tree in Cyprus, it must have been grown in some parts of this Island long before the 18th century.

The first place to grow apples was Prodhromos, a village in the southern mountainous range 4,400 feet above sea-level. The original trees were the common crab apples (seedlings) of *Malus communis* and *malus acerba*, which appear to be indigenous to the place, and there are at present trees of the former type growing at Prodhromos over 100 years old.

Through natural cross fertilization several varieties have been established and there are more than 40 varieties growing at present in that village.

About 40 years ago two new varieties, now known as Perapedhi large and Perapedhi red, were introduced by Mr. Williamson and planted at Perapedhi. These varieties were so successful and produced such a heavy crop of high quality fruit, in comparison with the old varieties, that soon they became very popular and were taken up by most growers in the hill villages. To-day the apple tree holds the first place among the deciduous fruit trees in the hill area. There are more than 40,000 trees of these varieties growing at present in the hill area and their cultivation is extending from year to year.

Climate.—The apple tree can grow quite successfully in all the hilly parts of the Island from 1,500 to 5,000 feet above sea-level. It is not affected by the winter cold and can stand a temperature of 60° F. below zero, but sudden and continuous heat waves can be destructive to the trees.

Although a few apple trees may be found in some isolated spots in the plains and lower altitudes this tree can never be grown profitably in such localities owing to unfavourable climatic conditions. It is as unreasonable to plant oranges up in the mountains as it is to plant apples in the plains and it is quite impossible to find both apples and oranges of the best quality growing side by side.

Soil.—The apple tree can grow successfully on most types of soils provided that these are not cold and heavy and that they have a porous subsoil; the best results however are obtained from a medium loam containing an abundance of humus and a sufficient quantity of lime.

Propagation.—Apple stocks are raised from seeds and vegetatively from suckers, stools and layers.

The first method has the great advantage of the stocks being easily raised and little labour is required. They are also considered to be of longer duration and more resistant to unfavourable soil and weather conditions. There is the serious objection that the seedlings are never true to type and of a uniform character, and consequently the trees thus raised are always more or less variable.

The influence of the stock on the general behaviour of the tree, and the desirability of having pure known races of stocks, and uniformity in the plantations are now recognized and methods of vegetative propagation are now successfully carried out at East Malling, England, and adopted by all apple-growing countries and have replaced the seed propagation. In Cyprus until lately the only methods adopted were propagation by suckers and seeds, but in the last 3 years propagation by stools and layers with stocks introduced from East Malling have been tried with satisfactory results.

Propagation by Seed.—Seeds of *Malus communis* (Glycomila) and *Malus acerba* (Xynomila) are used for the raising of seedling stocks.

Fruits for seed extraction should be obtained from healthy trees known to bear good crops regularly and they should be well matured.

The seeds are obtained from the fruit in two ways : the first is to cut the individual fruit open by hand and remove the seeds, and the second is to leave the fruit to decay and then crush it. The seeds can then be separated from the flesh with the help of water. All the good seeds, being heavier than water, settle in the bottom of the container, while most of the decayed flesh and rotten seeds float. After being removed from the fruits the seeds are either put in thin layers in a shady place and allowed to dry, and then put into bags, envelopes, etc., and kept in a cool place or they may be mixed with moist sand and put in flower pots or boxes, until sowing time. The pots or boxes containing the seeds should be put in a cold place with a temperature of 40° F. and the sand should be kept moist till the time of sowing.

The second method gives a higher percentage of germination of the seed and should be preferred if convenient.

Stratification of the Seed.—Prior to sowing the seeds in the seed-beds it is advisable to carry out pregermination "Stratification." This method ensures a higher percentage of success as all the factors influencing a successful germination, namely: air, moisture and temperature, can be kept better under control, there is much less danger of having the seeds destroyed by birds, insect pests, unfavourable soil and weather conditions and allows time to the cultivator for better preparation of the seed-beds.

The stratification of the seed is done 20 to 25 days prior to sowing the seeds in the seed-beds, about the middle of February. For this work empty boxes are used. These should be preferably 7 to 9 inches deep. Holes are made on the bottom of the boxes to drain away any surplus water during the watering of the seeds. To facilitate better drainage a layer of gravel is placed in the bottom of the box ; a layer of sand about half-an-inch thick is then put in followed by a layer of seed. Another layer of sand of the same thickness is then added and a layer of seeds and so on until 5 to 6 layers of seeds are put in the box.

It is advisable not to have more than 5 layers of seeds in a box as it has been observed that if there are more layers the bottom layer of seeds becomes decayed.

The boxes containing the seeds are then left under cover in a sheltered place and are watered every day or every other day to keep the seeds moist.

In about 3 weeks' time the seeds will break and are then ready to be sown in the seed-beds.

Preparation of the Seed-beds and Sowing of Seeds.—The soil should be preferably a sandy loam and should be trenched to about 12 to 18 inches deep in October soon after the first rains fall. It should be carefully cleaned from all weeds, roots, stones, etc. The seed-beds should be in a sheltered place, well protected from cold winds and as much exposed to the sun as possible. Plenty of well decayed manure must be added to the soil prior to sowing the seed.

Sowing of the Seeds.—The seeds are sown with the sand in beds 3 feet wide and about 16 feet long. The beds should be 18 inches apart. They are sown either in drills or broadcast. The first method should be preferred as in this way all the later treatments, thinning, weeding and hoeing are carried out more easily and perfectly.

The drills are made either with a stick or small axe about half-an-inch deep and two inches apart. After the seeds are sown they are covered with a little sifted soil, pressed lightly with a board and then watered.

It is advisable that the watering in the first two weeks should be carried out with a watering can. During this period the beds must be covered with branches of trees to protect the seed from the birds and facilitate better germination. The seed-beds should be watered at least every other day during this period.

In about 10 days' time the young seedlings will appear. When they reach a height of 2 to 3 inches they are thinned out so that they are not closer than two inches apart.

The beds are hoed every now and then to keep weeds down and are watered every week. The following winter the seedlings should be ready for transplanting in the nursery.

Nursery.—The nursery soils should be composed of sandy loam. It is necessary that growth in the nursery should be fairly but not unreasonably quick and the light soils lend themselves nicely to this.

The soil should be dug to a depth of 18 inches from October and properly cleaned as for the seed-beds. If the soil is poor, well-decayed manure should be added. It must be understood that it is unwise to plant young trees in heavily manured nursery land. On removal of ordinary orchard conditions with a poorer soil the tendency is for the trees to remain inert for some time previous to starting to grow.

The planting is carried out from December to March depending on the weather and soil conditions. Rows of 20 feet long and 18 inches between them are made and the seedlings are planted 9 to 12 inches apart just a little deeper than they were in the seed-beds.

The soil near the roots of the plants should be well treated. After planting they are watered and watering is continued every 8 to 10 days during the hot weather; hoeings and weeding are also carried out at regular intervals.

The seedlings, if properly looked after and under favourable conditions, should be ready for budding in June or in September with dormant budding.

Propagation by Suckers.—Apple trees and especially old ones give rise to a good number of suckers annually. These may be uprooted during the winter months and treated as in the case of seedlings above described. There is a belief among growers that trees worked on suckers have the tendency of giving rise to too many suckers, but this is incorrect as suckers are produced on the same principles as in the stool propagation which will be described later and which is so commonly used in England and other apple-growing countries.

Growers who desire to produce their own young trees may easily do so with little more extra work by preparing a small seed-bed in a corner of their orchard and raising their own seedlings in the way described above. These seedlings or the suckers, the latter being easily obtained from older orchards, can be planted in two or three rows among the permanent tree-rows, and, when they acquire the right size, can be budded with the desired varieties.

Propagation by Stools and Layers.—Stools and layers are the only methods adopted in other more horticulturally advanced countries for raising apple stocks.

These two methods have been experimentally adopted at Trikoukkia Station with stocks introduced from East Malling, England, No. XII, No. II and No. IX, three years ago and, although these were planted on a comparatively poor and untrenched soil, the results obtained were very satisfactory.

Propagation by Stools.—The young trees which are to form the stools should be strong, healthy plants one or two-years-old and should be planted in the winter two feet apart in rows, the distance between the rows being three feet. The plants during the year are regularly watered and hoed to keep down weeds in the same manner as when dealing with nursery seedlings.

A year later, in February, the plants are cut back to 2 inches above soil-level, this treatment resulting in the growth of a number of young shoots. When these have attained a height of about 4 to 6 inches, soil is drawn round the base of the shoots in a similar fashion to the earthing up of potatoes. Additional soil is added as growth proceeds until each stool is moulded up to a height of from 6 to 8 inches.

In early winter the soil is removed from the base of the shoots and the rooted plants severed at the base from the parent stool. The stools are then exposed until a new crop of shoots is produced the following spring when the plants are treated in the same way as in the previous year.

The shoots which have been earthed up will produce roots and when they are separated from the mother plants will form new plants which are planted in the nursery and treated as seedlings.

The life of a stool may last for several years. In the first year 4 to 6 young plants may be obtained and the number increases up to 15 as the stools get older.

Propagation by Layers.—One year trees are planted in the winter on the slant in rows with the stem forming an angle of thirty to forty degrees with the ground and lying along the rows. The rows should be three-and-a-half feet apart and the distance between the individual plants in the row three feet.

During the following winter the main stems and strong laterals are lightly trimmed, weak laterals are pruned to two or three buds from the base and the whole plant is laid and pegged down into the shallow drill so as to lie about two inches below ground-level.

When the buds commence to swell in spring the stems should be completely covered with about 1 inch soil. From every bud a new shoot will be produced and when they reach a height of 5 inches they should be earthed up. Earthing should be continued as growth advances until they are covered with soil up to 6 to 8 inches.

In the winter the soil is removed and each shoot will be found to possess a good root system on the spot covered with soil.

The rooted shoots are cut off from the mother plants and planted in the nursery, while the parent stems are left exposed until the following spring when they are treated for a further production of young plants. The shoots which have failed to root may be allowed to remain for subsequent pegging down.

In order to attain good success in either of the two methods described, the soil in which the mother trees are planted should be a sandy loam properly prepared and manured with well decayed manure. Plenty of moisture is also required for root formation and the plants should be irrigated as often as possible.

Stocks produced with the two methods described above are true to type with the advantage of fruiting earlier than seedlings.

Budding and Grafting.—Budding of the apple stock is carried out in late spring, May to June, or in late summer, September. The latter is called dormant budding as the buds remain dormant till the next spring when growth commences.

It has been found from experience that dormant budding gives a higher percentage of takes as the sap does not run too freely at that period yet the bark slips readily enough for good work to be done. The budwood is better matured, and the stocks become bigger. Also it has been observed that dormant budding gives a much stronger shoot than spring budding.

The ordinary shield method is used for budding. A good budder may have as much as 95% success with this method.

The principal points to be borne in mind in budding are :—

- (1) The stocks should be in good condition and of the right size not thinner than three-quarters of an inch.
- (2) They should be in a growing condition and when the incision is made by the knife the bark should be separated from the wood freely.
- (3) The budwood should be of the current year and well matured.
- (4) The best buds are cut from branches growing towards the middle or lower portion of the tree.
- (5) The best buds to use are those which are developed first and are nearer the butt end of the branch than the tip.
- (6) The bud should separate easily and should bear a small piece of cambium.
- (7) The budwood should be kept in good condition and should never be allowed to dry out.
- (8) The budding should be made 6 to 9 inches high from the ground.
- (9) The budwood should be obtained from healthy trees known to bear good crops for several successive years and of the desired variety.

After budding the buds are tied with raffia and are left so for 12 to 15 days. After this period the raffia is cut and those trees which have not taken are worked over again. The buds which have not taken will present a dark brown appearance.

When the buds take, the plant is cut 6 inches higher than the place of union. This will provide a "stub" to which the young growth from the bud is tied when it is 6 inches long, to support it from being blown off by strong winds. The stub is cleanly removed the following winter.

Grafting.—The best time for grafting is the spring soon after growth commences.

Whip, bark and cleft grafting may be practised, depending on the size of the stock and scions available.

For a successful grafting, the scions should be one-year-old and it is very important that they should be free from frost injury and in a dormant condition when applied. For this reason it is advisable to cut the scions 10 to 12 inches long during the winter, make them into small bundles and place them in boxes containing sand. These boxes should be kept in a temperature of 40° F. till the time of grafting.

Great attention should be paid in grafting so that the cambium of the scion and the cambium of the stock are in contact over as great an area as possible.

The scion should have 3 to 4 well developed buds and the lowest bud should be just above the sloping cut. After the operation of grafting, the stock and scion are tied together with raffia, care being taken to prevent displacement. The point of contact and the sections close to it are then covered with melted wax to prevent the drying of the tissues directly concerned in the process of unification and are left so for 4 to 5 weeks. During this period, if the grafting was successfully carried out, the union of stock and scion will take place and the buds will begin to give rise to shoots. The raffia is then cut off.

Treatment after Budding and Grafting :

- (1) No shoots should be allowed to grow below the union of stock and scion.
- (2) When the taken buds reach a height of 9 to 12 inches they should be staked to prevent them from being injured by strong winds, and keep the main shoot straight.
- (3) All the laterals should be removed and only the main shoot should be allowed to grow.
- (4) The main shoot should be headed back when it reaches a height of 30 inches.
- (5) The rows should be kept clean from weeds with frequent hoeings and regularly watered.

The trees should be ready to be transplanted the following winter as maidens.

Establishment of an Apple Orchard—Preparation of the Land.—The soil should be trenched to 3 feet deep and any big roots, stones, etc., removed. This work should be carried out as early as possible after the first rains fall and the soil left rough to the exposure of rain, frost, etc., until the planting time.

If the land is sloping it should be made into terraces and levelled, otherwise the surface soil which contains most of the soluble food substances, will be washed away when heavy rains fall and at the same time the roots of the trees will also be left exposed to cold winds, frost, etc.

Drainage.—Nothing is more important than good drainage for successful apple growing. If the land is not naturally drained artificial drainage should be carried out. Well drained soil means long lived trees, with bigger crops and better quality fruit. The majority of the fruit orchards in the hill area are suffering through bad drainage and one often hears complaints from growers that their trees grow quite well for some time and then suddenly cease to grow and gradually die off. The main cause of this is of course bad drainage. The trees grow satisfactorily and when the roots reach the underground water table, which is very high, they cannot perform their functions, become decayed and the death of the entire tree follows.

An easy and practical way of carrying out artificial drainage in the hill area where stones are in abundance is the following :

A trench of 3 to 4 feet deep and $2\frac{1}{2}$ feet wide is made towards the greatest slope of the orchard. Dry walls are then built at both sides of the trench each being 12 inches wide and $2\frac{1}{2}$ feet high. The space between the walls is covered in by means of long flat stones placed across the top, and after adding a layer of gravel and branches of trees to prevent the soil from falling into the trench, soil is added until the whole trench is brought to the same level as the other land.

This method has been adopted at the Trikoukkia Station and worked very satisfactorily.

Preparatory Manuring.—Four tons of well decayed manure should be applied to a donum of land and mixed with the soil prior to planting the trees. Lime should also be added to soils containing an abundance of organic matter as such soils are usually acid. Two hundred okes of quick lime should be applied to a donum of land after the trenching is carried out in November.

Marking of Holes and Distances apart.—The distance recommended for the varieties now in use, namely, Perapedhi Large, and Perapedhi Red, is 22 to 25 feet apart.

The practice followed by some growers of planting their trees closely and thinking that they will get more trees to a given area and subsequently bigger crop, is a wrong one and should be deprecated.

If the trees are planted at the proper distances the root system and branches of trees will have more room to develop properly, all the horticultural operations, such as pruning, spraying, cultivation, picking of fruit, etc., will be better carried out. A better circulation of air will also be allowed in the underground and aerial parts of the trees when they are planted at the proper distances and although a less number of trees is planted in the same area it will be found that in the long run the crop produced by these trees will be much bigger and the fruit of higher quality.

The holes may be marked either in the square or triangular systems. In Cyprus where all the cultivation is done by hand whichever method is adopted does not matter as long as the trees are planted at the proper distances.

Planting.—The apple tree may be planted from December till March, the actual time depending on soil and weather conditions. The best time to plant is when the soil is friable enough to sift well between the roots and it is far better to wait till this condition comes about, even if one has to wait till March. Naturally if such planting conditions occur earlier all the better but it is not the date or month that bring success but the condition of the soil.

Before planting, all the damaged roots should be cut off cleanly with a sharp knife and planting should proceed as fast as possible so that the roots are as little as possible exposed to dry winds.

If the land has not been previously trenched, holes of 3 feet deep and 3 feet wide should be made and the trees planted in them. On opening the holes the surface soil should be placed on the one side of the hole and the subsoil on the other. When the holes are opened surface soil is first put in the hole to such a height so that the trees are not planted deeper than an inch from what they were in the nursery and then the actual planting proceeds.

The idea of putting the surface soil in the hole first is that most of the food substances contained in the surface soil owing to some soil organism (the nitrifying bacteria) found only on the top soil are in a soluble form and therefore ready to be absorbed by the young roots as soon as the tree takes and growth commences.

In planting, the roots should be spread carefully on the soil and after being covered with 2 inches of surface soil the tree is slightly shaken, to allow a proper contact of the soil with the roots. More soil or subsoil is then added treading it firmly as it goes on to the roots layer by layer, instead of waiting till all the soil is in the hole before doing so.

Loose planting is often the cause of failure in planting young trees in Cyprus.

Staking.—The trees should be staked as soon after planting as possible. The stakes should be $3\frac{1}{2}$ feet long and driven in $1\frac{1}{2}$ feet leaving 2 feet, above ground.

It is preferable to drive the stakes in the holes as they are made and the trees planted against them. This would save any damage which may be caused to the roots in driving the stakes after planting is completed.

The best wood for stakes is "Ladgia." The part of the stake which will enter the soil should be tarred. If this is done, the stakes will last much longer.

It is important that the part of the stem to be tied on the stake should be wrapped with a piece of sack or any other rug to prevent any possible damage which might be caused on the bark of the tree during strong winds.

After staking is completed the trees are watered and in 8 to 10 days' time if no rain falls another watering is given.

Building up of an Apple Tree—"Pruning."—In the first three or four years following planting the aims in pruning should be to train the tree to take the right shape and to build up the head of the tree to consist of 8 to 12 main branches "Leaders" regularly placed round the trunk of the tree and strong enough to be able to support heavy crops in later years.

The shape most suited to the apple tree is the cup shape. With this shape the centre of the tree is kept opened and the air, sun, etc., can be better circulated to all the surface parts of the trees thus obtaining fruit of better size, flavour and colour. To give this shape to the tree soon after it is planted it is cut to the height at which it is desired to form the head of the tree. This varies from 2 to 4 feet according to variety, stock used, and situation of the orchard.

For Cyprus conditions and with the varieties now in use the short stem trees should be preferred. Short stem trees suffer less from the strong winds so prevalent in the hill area, all the horticultural operations, pruning, spraying, thinning and picking of fruit, are more easily and perfectly carried out and generally speaking the trees are better managed.

The young tree should therefore be cut soon after planting to 2 to 6 inches from soil level. In the spring when the buds begin to grow 3 shoots, the strongest and most suitably placed towards the top end of the tree are allowed to remain and eventually become the foundation branches of the tree. All the other shoots are removed as soon as they appear.

In the following winter pruning consists of cutting off from one-third to one-second or more of the previous season's growth; the stronger and more robust the growth the more may be left. When growth appears to be weak two-thirds of the growth may be removed.

The second year's growth will start from the 3 branches left and should be strong and vigorous. From these 3 branches many others will start and in May-June 6 to 8 shoots the strongest and those which follow the course of the previous year's growth and extend in the same direction are allowed to grow removing all the others by cutting them off close to the stem and leaving no stub. This will give an extra flow of sap to those which are left.

In the winter pruning, about half of the year's growth of the main 6 or 8 branches should be cut off. The laterals are shortened to 4 to 6 inches and a few twigs may be also left.

The third year's growth will commence on the 6 or 8 branches left the previous year and during May-June thinning out of undesirable shoots is again practised, allowing 3 or 4 more branches to grow as leaders where there is any vacant place.

The winter pruning will find the tree with 10 to 12 main branches "Leaders" regularly placed around the trunk of the tree and at this point it may be said that the permanent foundational structure and shape of the tree have been established. These main shoots are cut off to one-third of the year's growth and all laterals are shortened back to 4 to 6 inches again. From this period and onwards pruning will consist of :

- (1) shortening back the leaders by one-third to one-second of the previous year's growth.
- (2) shortening back to 4 to 6 inches all laterals in order to encourage the formation of fruit spurs.
- (3) removing all dead wood and any crossing branches.
- (4) keeping the open shape of the tree by removing any shoots which may be growing towards the centre.
- (5) bringing about a balance between the root system and overground parts of the trees so that regular annual crops are obtained.

Pruning is very essential to the longevity and regular bearing of the trees and to the improvement of the size, colour and general quality of the fruit.

In pruning cuts should be made always on the slant and as close to an outside bud as possible. All large wounds should be coated at once with grafting wax or tar.

Fruiting.—The apple trees begin to produce their first fruits, according to the variety and stock used, from the third till the sixth year after their planting. Trees worked on dwarf stocks produce fruit earlier than trees worked on vigorous stocks. The maximum crop is obtained when the trees are from 18 to 25-years-old.

An apple tree under favourable conditions may be grown quite profitably for over 60 years. The average crop produced by a properly looked after apple tree should be from 70 to 100 okes.

Thinning of the Fruit.—This is one of the most important operations in apple growing and growers are earnestly urged to practise it if they desire fruit of the best quality and size to be secured.

Apart from the production of fine fruit, thinning of fruit is essential for the well-being of the trees themselves. The root system and leaves of the trees are able to manufacture enough food for only a certain amount of fruit and if all the fruit carried were allowed to remain on the trees it would be more than they could support and the whole of their energies would be spent in attempting to develop and ripen a very large crop of small and low quality fruit to the exclusion of putting out fruit spurs and laterals for next year's crop. That would mean the receiving of a big crop of small sized and low quality fruit, which naturally will be sold at low prices as compared with that which fine fruit would fetch, and the probable loss of a profitable crop in the succeeding year.

It is a well-known fact among fruit growers in Cyprus that trees which are left unpruned and no thinning of fruit has been adopted bear only in alternate years. One often finds in the hill area bunches of 6 to 8 apples all left to develop and this is one of the many reasons why the fruit produce in Cyprus is not of that high standard that could be produced. No more than 1 to 2 apples should be allowed to grow on a bunch.

The first thinning is carried out two weeks after the fruit is set when four apples are allowed to remain on a bunch and the second thinning two weeks later when the fruit will be sufficiently developed to enable growers to choose the best two fruits to be left, the other two being removed.

Cultivation and Fertilizing.—The soil should be forked at least once every month during the summer months to keep down weeds and preserve the soil moisture so essential to the trees. In November the land should be forked to 6 to 8 inches deep and left rough as it is not until the following April when the basins are made for the irrigation of the trees during the hot weather. The trees should be irrigated according to the nature of the soil every two to four weeks.

As regards the manuring of the apple trees and the kind and quantity of manure to be used no definite rules can be laid down. This depends so much on general soil conditions, age of tree and the extent of exhaustion of natural supplies.

Generally speaking for the first few years following planting the trees require no manuring as the manure added prior to planting should be sufficient for the trees to carry on well till the fruiting commences. If the growth appears to be weak then a small quantity of sulphate of ammonia 50 to 100 drams per tree may be given just before growth starts.

When the trees begin to bear they should be manured at least every other year with organic manure. A quantity of 4 to 6 okes of well decayed manure should be given to every tree. It should be applied in the winter and it should be placed around the tree two feet from the stem. In the spring just before growth commences a complete fertilizer may be used. It should consist of 4 parts of nitrogen, 8 parts of superphosphates and 4 parts of potash.

The quantity required will depend again on general soil conditions and age of trees. About 1½ to 2 okes per tree may be regarded as sufficient for trees 8 to 10-years-old. This is best applied by either scattering broadcast round the tree, two feet from the stem to two feet beyond the branches or digging a trench 8 to 9 inches deep all round the tree just as far as the branches spread and sowing the fertilizer in that.

Liming.—Lime is very essential for the apple tree and it should be applied to the soil at least every other year. A quantity of 200 okes of quick lime should be enough for a donum of land and it should be added in winter.

Lime apart from the mechanical effect that it has on the soil can act also as a liberator on the various food substances and especially on phosphoric acid in the soil and turn them into a soluble form available for the roots of the plants. Besides its specific actions in thus rendering more soluble the soil constituents which nourish the plant lime exerts a very beneficial action by neutralizing the acids produced by the decay and nitrification of organic matter in the soil. It has been proved experimentally that lime is necessary as a base for the requirements of various artificial manures such as sulphate of ammonia, superphosphates, etc.

In Cyprus where apple trees are usually interplanted with various vegetables, potatoes, etc., and great quantities of natural and artificial manures are used lime is absolutely essential and it should be considered as a fertilizer of first necessity.

Varieties—Introduced Varieties :

(1) *Perapedhi Large* (similar to the variety "*Lord Derby*").—This variety has been introduced about 40 years ago and has been a great success under Cyprus conditions. Although a culinary apple it is locally consumed as a dessert. The tree grows over 30 feet high and bears heavy crops when properly looked after. An apple tree of this variety has produced in 1935 at Kakopetria 250 okes of fruit. The fruit is very large, green with yellowish stripes when fully ripe; apples weighing 150 drams each are often produced.

During the last few years an export trade has been established with Egypt and Palestine for this variety, the fruit being sold from 3*p.* to 6*p.* per oke on the spot.

(2) *Perapedhi Red* (similar to the variety "*Devonshire Quarrenden*").—This variety has been introduced at the same time as *Perapedhi Large* and has also proved a great success. The tree has a tendency for a very upright growth and may reach a height of over 30 feet. The fruit is small to medium size, deeply coloured dark red when fully ripen and of a very good flavour and taste. It is a dessert apple and is much preferred to the *Perapedhi Large* for local consumption; owing to its soft texture it cannot stand long journeys and attempts to export this variety have not proved satisfactory.

Louredia, *Kontonourika* and *Prodhromos Large Red* are three other important varieties introduced about 25 years ago and doing exceptionally well under Cyprus conditions.

The Department of Agriculture has imported during the last four years some of the best varieties growing in England and is trying them out at the Experimental Station, Trikoukkia, in order to ascertain whether these varieties could be as successful in Cyprus as they are in England and those which will succeed will be recommended to growers for further propagation. These varieties include 7 dessert varieties, viz.: *Beauty of Bath*, *Blenheim orange*, *Belle de boskoop*, *Cox's orange pippin*, *Laxton's*

Superb, Worcester Pearmain, Ellison's orange and 3 culinary, viz.: *Bramley's Seedling, Newton wonder* and *Grenadier*. Until results from these varieties are available, growers are advised to concentrate on the propagation of the above-mentioned five varieties.

Local Varieties.—The following are some of the principal varieties established through natural cross fertilization and at present growing at Prodhromos :

Sweet varieties : *Mouscomila, Glycomila, Zarpoudia, Mosfilomila, Foulomila, Bastardika, Tiromila.*

Sour varieties : *Picromila, Karamalloudia, Kokkinomila, Papiroudia, Platefila, Frouyiomila, Rodomila, Gadouromila, Samnadomila* and *Bordonomela.*

Bastardika, Mouscomila and *Foulomila* are very good eating varieties. The rest of the varieties are only suitable for cider making, a drink very popular in Europe and America. At the latter place a cider day is held annually on which cider is the only drink served.

The variety *Gadouromila* is a good keeper and can be kept in excellent condition in cool places till April-May.

Cross Pollination.—It is advisable not to stick to one variety only in planting up an apple orchard. A few trees of other varieties apart from the main one flowering at the same time should be planted for cross pollination. Most of the apple varieties are self-sterile but even with the self-fertile ones it has been experimentally proved that they are set more fruit when crossed with another suitable variety.

Insect Pests.—The following are some of the most important insect pests attacking the apple tree :—

(1) *Codling Moth (Carpocapsa pomonella).*—This pest is widely spread in all the apple-growing villages and as much as 90% of the fruit is attacked where it is uncontrolled. Control can be obtained by spraying the trees with lead arsenate, the first spraying being carried out when three-fourths of the petals have fallen, thirteen drams of lead arsenate with the required spreader, or one packet of lead arsenate with spreader as supplied by the Agricultural Department being mixed with 10 okes of water. A second spraying should be done about 18 days later, using the same materials or 50 drams of white oil emulsion instead of the spreader. Two or three further sprayings should be carried out at intervals of two weeks with lead arsenate and white oil emulsion as for the second spraying. This spraying programme has been carried out at Perapedhi with a 95% success. In addition to this spraying all fallen fruit should be collected and destroyed frequently as it usually contains the larva of this pest. During the first week of June bandages of sacking or rugs should be placed on the trees, and these will give shelter to the larvae which can then be destroyed. Instead of these bandages, bands of chemically treated paper can be used, any larvae sheltering in these being killed by the chemicals.

(2) *Apple Sirividhi (Hyponomeuta padellus).*—The larvae of this pest eat the leaves and young shoots of the tree causing complete defoliation if left unchecked. It can be controlled by sprayings with lead arsenate in the same proportion as for the first spraying against the Codling Moth, as soon as the small larvae appear. Two or three sprayings at intervals of two weeks should give a proper control.

(3) Woolly Aphis (*Eriosma lanigerum*).—This serious pest is to be found in almost every apple-growing village and when in great numbers it causes severe damage to the entire tree by sucking the sap. It can be controlled by spraying with nicotine sulphate five drams to ten okes of water with twenty-five drams of soft soap as a spreader. Nicotine sulphate is a contact wash and must cover well every individual insect in order to obtain satisfactory results. It should be applied as soon as the pest appears and several sprayings should be carried out to keep this insect in check. Large wounds on the trees should be avoided. If there are any large wounds great numbers of insects will be found on them and in such a case they should be painted over with linseed oil or paraffin and then the wound carefully cleaned with a sharpened knife and painted over with grafting wax or tar. Badly affected shoots should be removed and destroyed immediately.

(4) Scale Insect (*Parlatoria olea*).—This pest attacks the stem and branches of the trees and also sucks the sap. It can be controlled with sprayings in the winter soon after pruning with white oil emulsion seventy drams to ten okes of water. The spraying should be applied with great pressure well over the tree.

(5) Wood Leopard Moth (*Zeuzera pyrina*).—The larvae of this pest bore into the wood of stem and branches and cause great damage to the tree. It can be controlled by means of a wire pushed into the hole as far as possible in order to destroy the larvae. Also if a few crystals of paradichlorobenzene or a piece of cotton soaked with benzine can be placed in the hole and the hole then closed with grafting wax or clay this will cause the death of the larvae.

More particulars of the insect pests attacking the apple tree may be found in the Agricultural Department Leaflet No. 22.

FUNGUS DISEASES.

1. *Powdery Mildew*.—This disease as the name implies is caused by one of the so-called "Powdery" mildews and is of the same nature and family as the well-known powdery mildews of the vine, rose and water melon. It is, however, distinct from these and can attack only apples and pears.

As with other powdery mildews the fungus consists of a network of fungus threads on the surface of the attacked plant and obtains its nourishment by means of suckers penetrating below the surface. Masses of spores are borne on slender stalks and give diseased parts of the plant the familiar powdery appearance.

The parts of the plant affected are the leaves and twigs. At the end of the season when the leaves have fallen diseased twigs of the current year's growth can easily be recognized by this white appearance. It is in the buds of such twigs that the fungus passes the winter in a dormant state. When those buds which are infected but not killed open, all leaves produced are infected and appear as a white rosette of leaves.

This constitutes the primary infection and it is from here that spores are carried on to healthy leaves and so produce secondary infection and, if weather conditions are suitable, the disease may rapidly spread through the plantation.

The disease can best be controlled therefore by eliminating the sources of the primary infection. This is done by pruning off all the mildewed shoots which can be seen in the autumn. These should be cut off a short distance below the withered part as these buds are also likely to be infected though not visibly so.

Trees should be again gone over in the spring and all freshly opened mildewed shoots removed.

2. *Scab or Black Spot*.—This disease causes dark olive green scabs on the leaves and fruit. On the leaves these are of irregular shape of a sooty appearance and frequently follow the veins. On the fruit the fungus forms slightly sunken spots which vary in size and shape according to the development of the fruit at the time of attack. If the fruit is severely attacked when young considerable cracking and distortion may take place. The young twigs are also attacked and it is from these that the disease starts each year.

Control measures consist of cutting out diseased twigs and in spraying the trees with Bordeaux mixture or lime sulphur. The first spraying should be done when the trees are in the pink bud stage—just before flowering—a second spraying should be given when the petals fall and can conveniently be combined with the first lead arsenate spray for Codling Moth.

3. *Root Rot*.—Trees growing in undrained situations are occasionally attacked by the white Root Rot. The symptoms are a general yellowing of the foliage and a heavy fruit set—the fruit, however, remaining small. The tree usually dies the following year. On digging up such a tree it will be found that most of the fine root system has been destroyed and that the large roots are covered with strands of white fungus and a fluffy accumulation of greenish grey fungus threads.

Affected trees should be removed with as much of the root system as possible and the hole left exposed to the sun.

Where this disease is suspected the advice of an Agricultural Officer should be sought.

Vine Experiment Station, Saittas.

In the March 1937 issue of the *Cyprus Agricultural Journal*, observations were made on the results of certain experiments at Saittas. These experiments have now been carried on for five years and the results of the past year have borne out the results obtained previously.

The varieties under discussion are the three well known local varieties :—

- (a) Local Red or Mavron.
- (b) Local White or Xynisteri.
- (c) Local colour variety or Maratheftico.

(a) LOCAL RED, MAVRON.

This variety is growing over 99% of Cyprus vineyards and trials were continued to find out if yields would be improved by more suitable methods of pruning and cultivation.

Again results showed that short pruning to the shape of a small tree with 3-4 arms, with a bearer with 2 eyes on each arm, led to an increase yield of from 30% to 40% over plots treated in the usual Cyprus way. Furthermore it is noted that vines are more vigorous if pruned in this manner.

(b) LOCAL WHITE, XYNISTERI.

Experiments with this variety demonstrate the value of long pruning, i.e. with bearers containing about four eyes. Once again the yields of plots that were given long pruning are more than three times those of plots pruned in the usual Cyprus way.

(c) MARATHEFTICO.

Experiments were continued in order to find which method of pruning is most suitable for this variety. The Cyprus method is compared with both long and short pruning and, although results are inconclusive, it appears that long pruning gives the best yield. Growth, however, is more vigorous on vines that are pruned short.

Once again the variety reacted very well to topping the shoots before flowering and yields from topped plots were about double those from untopped plots.

EXPERIMENTS ON SULPHURS.

An experiment was carried out at Saitta, on a plot of vines, with the object of testing the efficiency of a "black" sulphur produced locally.

A plot was divided in two equal parts, the half being treated with imported sulphur (usually used in Cyprus), the other half being treated with the local black sulphur.

Four treatments were given to each plot at the same date and hour, on the following dates :—

1st sulphuring on the 24th April, 1937.

2nd sulphuring on the 2nd June, 1937.

3rd sulphuring on the 23rd June, 1937.

4th sulphuring on the 8th July, 1937.

The season was favourable to the development of oidium all over the Island.

Results :

- (1) No oidium in the plot sulphured with imported sulphur.
- (2) A small attack, rising up to 2% of the plot, was observed in the plot treated with the local black sulphur.
- (3) No burning, occasioned by the sulphur, was observed in either of the plots.
- (4) The imported sulphur appears to be more adherent than the local sulphur.

The experiment will be continued in 1938 with the addition of a complementary plot to be left as control.

The Ox-Warble Fly.

THE Government Veterinary Service is at present engaged on work which will, it is hoped, bring about a considerable reduction in the prevalence of the ox-warble fly, a pest which at present causes much economic loss to farmers and to those interested in the trade in hides.

Every farmer is acquainted with the difficulty of controlling working oxen when they are being attacked by these flies on bright days during the early months of the year, but few persons associate the attacks of the flies with the warbles (*atharka*), small tumours which appear on the backs of the animals during the period December to April. Each of these swellings contains a short thick maggot which is the larva of the fly. When the larva is mature it forces its way through the hole which it has made in the animal's skin, falls to the ground and forms a pupa from which in the course of a few weeks the adult fly emerges. The fly deposits its eggs on the skin of the cattle, usually on the lower portions of the limbs or below the abdomen. When depositing its eggs the fly causes a considerable amount of alarm to the cattle. Within a short time each egg hatches out into a very small larva (worm) which perforates the skin and travels through the tissues to the wall of the oesophagus (gullet), where it remains several months before passing on to a new position underneath the skin of the animal's back. It then bores a hole in the skin through which it breathes, and it grows and develops for a further three or four months before it is ready to emerge from the hole.

The presence of the larva in the animal seldom affects the animal's health but the parasite is of great economic importance for two reasons : firstly, the excitement of the cattle (caused by the adult fly when ovipositing) makes it necessary to stop working the animals during the bright spring days when the flies are prevalent, otherwise serious accidents may occur, and secondly, the holes made in the skin by the larvae never completely heal and are always found when the animal's hide is tanned, thus rendering the hide of very low value.

Experience in other countries has shewn that the larvae can be easily destroyed by the application of a suitable dressing which will penetrate the breathing holes in the warbles on the animals' backs, and that further infestation in the following season can be prevented in this manner. It has also been shewn that the adult fly lives only a very short time and that it does not fly far from the locality in which it emerged from its pupa.

Preliminary control dressings, accompanied by a survey of the prevalence of warbles, were carried out early in 1937 in a group of villages south of Famagusta. More extensive work this season has been carried out since December, 1937, monthly dressings being carried out on all cattle in some 25 villages in the south-eastern part of the Island (part of Famagusta and Larnaca Districts), 50 villages in the north-western part (portions of Nicosia and Kyrenia Districts) and a group of 12 villages in the south of Paphos District. The dressings are made free of charge by the Veterinary staff, owners are required only to bring their cattle to an appointed central place in each village (in order to expedite the work) and the village authorities are asked to assist in ensuring that every animal is so produced (if any affected animals were left untreated the success of the scheme would be spoiled to a great extent). The dressing will be repeated monthly until April, 1938, and it is hoped to extend the campaign to a considerably greater area next season.

The total eradication of the warble pest from cattle in Cyprus should prove to be neither difficult nor expensive to accomplish, provided there is active co-operation on the part of village authorities and owners of cattle. It is pleasing to record that such co-operation has been forthcoming and that the work hitherto carried out, involving the examination and treatment of over 25,000 cattle, has been done without any need for the use of compulsory powers.

March, 1938.

R. J. R.

Pests and Diseases of the Carob Tree.

The More Important Pests of the Carob Tree.

WHITE SCALE (*Aspidiotus hederæ*, Vallot).—Although several different kinds of scale insects attack the carob tree this is the only one whose attack is ever serious, but the attacks of this scale sometimes occur to a very serious extent in some localities, the branches, leaves and pods being thickly covered with the small white scales.

Owing to the trees being large and evergreen thorough spraying at any time would be difficult but would be effective if done with white oil emulsion. Alternatively, very badly infested trees can be severely pruned and then sprayed or painted with an oil emulsion.

CAROB MOTH (*Myelois ceratoniae*, Zell.).—This insect attacks dried fruit and other stored products, including stored carobs, and it also attacks the carob pods while they are still on the tree. From pods attacked on the tree a sticky juice exudes which falls on to the leaves and twigs below.

Against attacks in stores fumigation would be effective in suitable stores but is not usually practicable. Stores should be thoroughly cleaned before use and attacked carobs should not be mixed with sound ones.

BORING BEETLES (especially *Cerambyx velutinus*, Brull.).—These insects tunnel inside the trunk and branches gradually causing the death of the tree. When the holes are seen, owing to the sawdust-like material ejected from them, the insects can be killed by pushing a wire as far as possible into the hole or inserting a small amount of paradichlorobenzene into the hole and then sealing the hole with grafting wax or clay.

CAROB MIDGE (*Asphondylia gennadii*, March.).—This insect causes the stunting of carob pods known as "Brachycarpia" disease, which is due to the presence of its larva in the young developing pod. The insect lays its eggs in the flowers or young pods in the autumn and the larvae feed inside the pods in the winter. In the early spring the attacked pods remain small and become misshapen while the healthy pods are growing rapidly. The adult insects come out of the pods from about the end of April to June. There are at least two further generations in the young carobs of the earlier flowerings during the summer and autumn.

Control measures have not been found practicable against this insect although it appears that, where it could be done, the collection and destruction of the dwarfed and misshapen pods in April, before the adults emerge, would reduce considerably the attack on the new pods in the autumn.

Diseases of the Carob Tree.

The carob tree, in common with most plants which are indigenous to the area in which they are cultivated, is not subject to any disease which seriously affects the crop.

The leaves and pods are occasionally attacked by a fungus, *Cercospora ceratoniae* Sacc., which causes small circular brown spots up to 1 cm. in diameter. It is more frequently seen on trees which are in a weak condition.

Mildew, *Oidium ceratoniae* Ames, occurs on both leaves and pods and may cause slight deformation of the latter when attacked in the young stage.

Other and more serious diseases are those caused by fungi attacking the trunk and main branches. These are usually wound parasites and obtain entry through injuries such as broken branches, etc. The one most commonly met with is *Ganoderma applanatum* (Pers.) Pat. This fungus produces a cushion-like fructification with a golden brown velvety surface and is seen on old branches on the crotch or more frequently at the base of the trunk. This only appears after the fungus has penetrated a considerable distance into the wood. Trees can best be protected by cutting away dead branches so as not to leave a snag and covering the wound with paint. When seen the fungus should be cut out and destroyed to prevent the dissemination of spores. The fungus is not likely to attack trees which are well cared for and are carefully pruned.

SOME LITERATURE ON THE CAROB TREE.

P. Gennadius, *The Carob Tree*.

Cyprus Gazette.—"Agricultural Supplement": *Carobs, the Consols of Cyprus*.

E. Sanvaigso, *Les culture sur le littoral de la Méditerranée*.

Ch. Pelaghias, *Le caroubier et la caroube*.

M. Schwartzman, *The Carob Tree and its Cultivation in Palestine*.

Agricultural Department Publications.

THE following bulletins and leaflets have been published in English, Greek or Turkish as indicated by the letters *E.*, *G.* or *T.* after each title.

BULLETINS.

Industrial Series :

No. 1.—“The Grape and Wine Industry of Cyprus.” By M. T. Dawe, O.B.E., F.L.S. *E.*

No. 2.—“The Tanning Industry.” By M. T. Dawe, O.B.E., F.L.S. *E.*

Horticultural Series :

No. 1.—“Some Observations on the Citrus Industry of Palestine, with reference to Application of Improved Methods to the Citrus Industry of Cyprus.” By B. J. Weston, M.A., M.Sc., F.R.H.S. *E.*

No. 2.—“Picking, Grading and Packing of Citrus Fruits. A Guide for Exporters.” By B. J. Weston, M.A., M.Sc. (Agr.) *E., G. & T.*

The above two series are now combined and the following have been published :—

No. 3.—“Report on Soil Erosion in Cyprus.” By A. Pitcairn. *E., G. & T.*

No. 4.—“Summary of Agricultural Legislation in Cyprus.” *E.*

Entomological Series :

No. 1.—“Investigations into the Locust Plague in Cyprus.” By Ch. G. Pelagias, I.A. (Gx.), F.A.I. (Gx.), (also *Corrigendum*). *E.*

No. 2.—“A Survey of Olive Pests.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.* (*T.* out of print).

No. 3.—“Insect Pests and Fungus Diseases of Cyprus and their Control.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.*

No. 4.—“Injurious Insects of Cyprus.” By H. M. Morris, M.Sc., F.R.E.S. *E.*

Mycological Series :

No. 1.—“The Control of Fungus Diseases.” By R. M. Nattrass, B.Sc., Ph.D., D.I.C. *E., G. & T.* (*G.* out of print.)

LEAFLETS.

No. 1.—“Petroleum Emulsion.” *G.* (Out of print.)

No. 2.—“Boll Worms of Cotton.” *G.*

No. 3.—“Collection, Sorting and Packing of Oranges.” *G.* (Out of print).

No. 4.—“The Cultivation of the Orange Tree.” *G.*

No. 5.—“Carpocapsa” *G.* (Replaced by No. 22.)

- No. 6.—“General Rules for Silkworm Rearing.” *E. G. & T.*
(Reprinted, see also No. 8, Educational Series).
- No. 7.—“Cultivation of Almond Trees.” *G.* (Out of print.)
- No. 8.—“Soil Manuring.” *G.* (Out of print.)
- No. 9.—“Control Measures for Red Scale of Citrus.” *G.* (Out of print.)
- No. 10.—“Seed Beds.” *G.* (Out of print.)
- No. 11.—“The Collection of Sumach.” *G.*
- No. 12.—“The Almond Pest (*Eurytoma amygdali*, End.)” *E., G. & T.*
(Out of print.)
- No. 13.—“Outline of the Rat Destruction Campaign for 1930.”
E., G. & T. (Out of print.)
- No. 14.—“Potato Tuber Moth.” *E., G. & T.* (Out of print; replaced
By No. 17).
- No. 15.—“Warble Flies.” *E., G. & T.* (*E.* out of print.)
- No. 16.—“Downy Mildew of the Vine (*Plasmopara viticola*).” *E., G. & T.*
- No. 17.—“Potato Tuber Moth.” *E., G. & T.* (Replaces No. 14.)
- No. 18.—“The White Rot of Onions in Cyprus.” *G. & T.*
- No. 19.—“The Production of Silage.” *E., G. & T.* (Out of print;
see No. 7 Educational Series.)
- No. 20.—“Importation of Plants, Fruit, etc., into Cyprus.” *E.*
(Reprinted and brought up to date.)
- No. 21.—“*Ceratitis capitata*, Wied. Mediterranean Fruit Fly.”
E., G. & T.
- No. 22.—“Pests of the Apple Tree.” *E., G. & T.* (Replaces No. 5.)

Educational Series :

- No. 1.—“Agricultural Resources of Cyprus.” *E., G. & T.*
- No. 2.—“Breeding, Feeding & Management of Cattle.” *E., G. & T.*
- No. 3.—“Agricultural Calendar.” *E., G. & T.*
- No. 4.—“Linseed (*Linum usitatissimum*).” *E., G. & T.*
- No. 5.—“Sesame (*Sesamum indicum*).” *E., G. & T.*
- No. 6.—“Production of Olives and Olive Oil.” *E., G. & T.*
- No. 7.—“Production of Silage.” *E., G. & T.*
- No. 8.—“Sericulture.” *E., G. & T.*
- No. 9.—“Citrus Fruit Growing in Cyprus.” *E., G. & T.*
- No. 10.—“The Breeding and Management of Sheep in Cyprus.”
E., G. & T.
- No. 11.—“Flax.” *E., G. & T.*
- No. 12.—“Diseases of Poultry.” *E., G. & T.*
- No. 13.—“Irrigation in Cyprus.” *E., G. & T.*
- No. 14.—“Cereal Crops.” *E., G. & T.*
- No. 15.—“Diseases of Sheep and Goats.” *E., G. & T.*

EDITORIAL AND ADVERTISEMENT NOTICES

All communications for publication should be addressed to the Editor, *Cyprus Agricultural Journal*, Department of Agriculture Nicosia.

Contributions are invited, written on one side of the paper only. It should be understood that unaccepted manuscripts can not be returned unless postage is prepaid.

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SCALE OF ADVERTISEMENT CHARGES.

A special reduced rate is charged for all advertisements inserted. As the Journal is circulated throughout the Colony and copies are sent to all Colonies Overseas it may be regarded as a valuable medium for advertising.

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PRIVATE ADVERTISEMENTS.

For Wants, Articles for Sale or Exchange, Notices of Meetings, Events, etc., for the first 16 words, 2s. Exceeding 16 words but not exceeding 32 words, 4s. For every additional 8 words 6p.

Advertisements should be written on one side of the paper only, and should reach the Editor, *Cyprus Agricultural Journal*, not later than the 10th of the month of issue.

The "*Cyprus Agricultural Journal*" is published in March, June September and December.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

Meteorological Data, Cyprus.

SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS. DECEMBER, 1937.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	65.42	45.10	0.06	3	0.03	2.30	—
Athalassa	—	—	—	—	—	2.24	—
Morphou	69.97	46.03	0.31	4	0.10	2.04	—
Makhaeras	—	—	0.40	1	0.40	4.44	—
<i>Famagusta District :</i>							
Famagusta	69.71	46.71	0.66	4	0.26	3.15	—
Akhyritou	67.30	42.60	0.62	3	0.49	2.53	—
Rizokarpaso	—	—	1.25	5	0.50	4.38	—
Lefkoniko	—	—	0.25	3	0.11	2.82	—
<i>Larnaca District :</i>							
Larnaca	66.52	47.61	—	—	—	4.72	—
Lefkara	—	—	0.20	1	0.20	4.83	—
<i>Limassol District :</i>							
Limassol	67.61	49.00	0.79	8	0.34	3.60	—
Saittas	—	—	1.68	9	0.50	3.79	—
Trikoukkia	52.62	40.75	2.90	5	1.40	6.56	—
Alekhtora	—	—	1.26	5	0.37	4.70	—
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	3.57	—
Polis	—	—	0.55	2	0.30	3.42	—
<i>Kyrenia District :</i>							
Kyrenia	66.72	52.00	0.99	9	0.26	4.48	—

JANUARY, 1938.

<i>Nicosia District :</i>							
Nicosia	59.19	42.10	2.94	20	0.90	3.71	—
Athalassa	—	—	2.69	14	0.78	3.33	—
Morphou	60.10	43.30	3.73	18	0.43	3.17	—
Makhaeras	—	—	9.05	12	1.80	6.00	—
<i>Famagusta District :</i>							
Famagusta	62.90	42.48	4.39	15	1.30	4.57	—
Akhyritou	60.55	39.74	3.99	17	1.07	3.24	—
Rizokarpaso	—	—	8.79	14	3.15	6.18	—
Lefkoniko	—	—	3.17	13	1.20	2.91	—
<i>Larnaca District :</i>							
Larnaca	60.42	40.84	3.93	10	0.95	5.16	—
Lefkara	—	—	8.09	14	1.72	5.12	—
<i>Limassol District :</i>							
Limassol	62.19	44.71	6.36	18	0.96	4.48	—
Saittas	—	—	9.67	19	1.63	6.56	—
Trikoukkia	43.40	31.75	21.15	20	2.80	8.55	7.10, 15,
Alekhtora	—	—	8.62	16	1.25	5.12	23.24,
<i>Paphos District :</i>							26.30.
Paphos	—	—	—	—	—	3.92	—
Polis	—	—	5.89	13	0.90	3.68	—
<i>Kyrenia District :</i>							
Kyrenia	60.55	48.20	6.91	20	1.32	5.71	—

Note.—Compiled from returns furnished by Public Works Department.

FEBRUARY, 1938.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	57.57	40.18	2.33	15	0.75	2.47	9.25
Athalassa	—	—	1.76	8	0.53	2.13	—
Morphou	58.86	40.61	2.76	11	0.85	2.42	—
Makhaeras	—	—	1.95	2	1.80	4.50	—
<i>Famagusta District :</i>							
Famagusta	62.57	41.57	2.02	9	0.34	2.76	—
Akhyritou	59.40	38.60	1.76	9	0.42	2.00	—
Rizokarpaso	—	—	2.60	12	0.56	3.60	—
Lefkoniko	—	—	1.28	10	0.34	2.42	—
<i>Larnaca District :</i>							
Larnaca	60.50	40.57	1.94	7	0.60	3.14	—
Lefkara	—	—	2.16	6	0.68	3.43	—
<i>Limassol District :</i>							
Limassol	61.00	43.00	2.22	15	0.80	2.73	—
Saittas	—	—	4.60	14	1.46	5.01	10.26
Trikoukkia	41.72	29.60	10.23	14	1.66	6.93	1.5-11
Alekhthora	—	—	3.98	13	0.80	3.89	21-25
<i>Paphos District :</i>							
Paphos	—	—	—	—	—	3.48	—
Polis	—	—	1.85	7	0.70	3.26	—
<i>Kyrenia District :</i>							
Kyrenia	58.14	45.54	5.81	14	2.41	4.69	—

Note.—Compiled from returns furnished by Public Works Department.

The Horse Breeding Law, 1930.

LIST OF STALLIONS LICENSED FOR 1938.

NICOSIA DISTRICT.

Village	Owner's name	Reg. No.
Akaki ..	Michael Th. Rafti ..	29
Argaki ..	Polyvios Theophani ..	153
Astromeritis ..	Christoforos Evangeli ..	26
Kalokhorio ..	Yioryis Papaconstantinou ..	262
Lefka ..	Hussein Djafer Arabadji ..	255
Louroujina ..	Mehmed Youssouf Mukhtar ..	22
Lymbia ..	Andronikos Petri ..	32
do. ..	Kyr. Constantinou ..	33
Mammari ..	Nicolas Haji Haralambou ..	206
Morphou ..	Vasilis T. Spanos ..	18
do. ..	Andreas Ahapittas ..	249
Yeri ..	Yeoryos Petri ..	16

LARNACA DISTRICT.

Alaminos ..	Rifat Jumaa ..	260
do. ..	Salih Jumaa ..	64
Aradhippou ..	Costis Kyriakou ..	15
do. ..	Lefteris Towli ..	225
do. ..	Andreas Gregori Orphanou ..	277

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No</i>
Athienou	..	Haris Antoni	..	66
do.	..	Costas N. Haji Vrashimi	..	96
do.	..	Vasilis M. Phiakou	..	159
do.	..	Nicolas Vassili Yiancou	..	276
Larnaca	..	Ipermachos Kyriakou Petroladhas	..	288
Voroklini	..	Panayis Theodosi	..	106
FAMAGUSTA DISTRICT.				
Akanthou	..	Yiannis Hambi	..	270
Asha	..	Antonis Michael	..	92
do.	..	Christos Haji Lavithi	..	234
do.	..	Kyriakos Antoni	..	239
do.	..	Elengou Prokopi	..	274
do.	..	Michael Yianni	..	285
do.	..	Eleni Demetri Kounalli	..	208
Ayios Andronikos	..	Spyros Yeoryi	..	65
do.	..	Christofis Hambi	..	240
Ayios Elias	..	Constantis Stylli	..	246
do.	..	Yeorgios Christodoulou	..	265
Ayios Seryios	..	Michael Antoni	..	284
Ephtakomi	..	Loizos Hambaka	..	219
Galatia	..	Akil Mustafa Gonie	..	54
Kalopsidha	..	Yeoryios Antoniou	..	267
Komi Kebir	..	Kyriakos Constanti	..	68
Kondea	..	Christos Hanni	..	259
Lefkoniko	..	Mehmed Salih	..	38
do.	..	Christos Haji Symeou	..	41
Leonarisso	..	Chrysanthos Panayi	..	56
Lysi	..	Minas Lysandrou	..	80
do.	..	Artemis Haji Constandoura	..	227
Melanagra	..	Kallis Kyriakou	..	60
Milea	..	Sotira Panayi	..	193
Ovgoros	..	Djafer Emin A. M. Mustafa	..	213
Paralimni	..	Andreas K. Xiouri	..	72
do.	..	Evangelis Haji Vraha	..	172
do.	..	Nicolas G. Tsiakouras	..	210
do.	..	Demetris A. Maouris	..	244
do.	..	Avraamis Anastasi	..	258
Peristeronopiyi	..	Andreas Louka	..	45
do.	..	Const. K. Haji Yeoryi	..	73
Phrenaros	..	Kyriakos Theori	..	71
Rizokarpaso	..	Panayiotis K. Sakka	..	171
do.	..	Christofis N. Koulia	..	241
do.	..	Pandelis N. Haji Hari	..	281
Sotira	..	Vasilis Demetri	..	252
Stylos	..	Annezou Nikou	..	269
do.	..	Kyriakos G. Voskou	..	282
Trikomo	..	Marikou Kyriakou	..	224
do.	..	Kyprianos Stylli Halli	..	266
do.	..	Eleni Philippou Pieri	..	279

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Vatili	..	Andreas G. Iona	..	86
do.	..	Vasiliki Haji Christodoulou	..	89
Yialousa	..	Christofis Panayi Pitchi	..	280
LIMASSOL DISTRICT.				
Anoyira	..	Thoukis Solomi	..	143
Asgata	..	Demosth. Evangeli	..	119
Ay. Phyla	..	Costis P. Silikiotis	..	118
Limassol	..	Mehmed Mustafa	..	40
Pakhna	..	Theodoros Evgeniou	..	121
do.	..	Haralambos M. Kais	..	283
Phasoula	..	Nicolas Evangelis	..	272
PAPHOS DISTRICT.				
Dhrousa	..	Yiannis Sava	..	139
Kissonerga	..	Evangelis Haji Nicola	..	126
do.	..	Haji Towlis Haralambou	..	129
Kouklia	..	Mehmed Hassan Kokkinos	..	215
Ktima	..	Veli Tselebis	..	127
Kelokedhara	..	G. Christodoulou Sirimis	..	275
Lapithiou	..	Mehmed Mulla Osman	..	263
Lasa	..	Yeoryios Ch. Ellinas	..	130
Pano Arodhes	..	Harilaos Nicolaou	..	136
do.	..	Chrysost. Panayiotou	..	214
Peristerona	..	Solomon Haralambou	..	230
Prodromi	..	Avraamis Sava	..	248
Stroumbi	..	Sofoklis Constanti	..	178
Tala	..	Costis Papa Daniel	..	286
KYRENIA DISTRICT.				
Agridhaki	..	Haralambos Yianni	..	147
Asomatos	..	Christallou Michaeli	..	146
do.	..	Antonis Haji I. Hanni	..	150
Ayios Amvrosios	..	Nicolas Haji Demetri	..	256
Ayios Ermolaos	..	Efstathios Christofi	..	166
Ayios Yeoryios	..	Costis N. Spanou	..	157
Bellapais	..	Savas K. D. Jirkaji	..	161
do.	..	Savas K. Demetriades	..	236
Dhiorios	..	Gregoris Haji Michael	..	148
Dhikomo, Kato	..	Loukas G. Loukaides	..	273
Kyrenia	..	Shakir Hussein	..	158
Lapithos	..	Polyk. Panayioti	..	99
Larnaka tis Lapithou	..	Miltiades Constanti	..	152
do.	..	Kleanthis Stylianou	..	287
Myrtou	..	Cleov. Stylianou	..	149
Siaklipos	..	Lavithis Demetriou	..	232

ROBERT J. ROE,

9th March, 1938.

*Chief Veterinary Officer,
Inspector of Horse Breeding.*

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Manager, Stock Farm, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Officer in Charge of the Farm.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, including the Nursery Garden, Nicosia, and Officers are stationed at Kythrea, Dheftera and Morphou.

Lefka Sub-District.—Agricultural Officer, Ibrahim Hakki Effendi, is in charge, including Pyrgos area.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove. Officers are stationed at Yialousa, Lysi, Lefkoniko and Triкомо and Tobacco Instructor at Yialousa.

LARNACA AND LIMASSOL DISTRICTS.

Agricultural Officer, Mr. M. Papaïacovou, is in charge including Larnaca Nursery Garden. Officers are stationed at Larnaca, Skarinou, Nisou, Agros and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Kyprianides, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klockkaris, is in charge. Paphos District includes Paphos and Polis Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelo-kedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant.

Table Showing Distribution of Stud Animals at the Stud Stables and Government Stock Farm, Athalassa on 1st July, 1937.

Station	Stallion	Donkey	Bull	Breed of Bull
Nicosia	.. —	—	Minstrel	Shorthorn
Athalassa	.. Waterkoscic	No. 42	Ambassador	Shorthorn
	.. Kildare Guard	No. 38	.. Monarch ..	Kerry
	.. Llywnog's Model	No. 55	.. No. 469 ..	Cyprus
Ay. Theodoros	.. Pitchford	No. 50	.. No. 460 ..	Cyprus
Larnaca	.. Friars Flutter	No. 52	.. No. 462 ..	Cross-bred
Lefkoniko	.. Marcher Lord ..	No. 48	.. No. 443 ..	Cyprus
Morphou	.. —	..	.. No. 468 ..	Cyprus
Ktima	.. —	No. 41	.. No. 497 ..	Native
			.. No. 454 ..	Kerry
Polis	.. Sonny Boy	.. No. 49	.. No. 457 ..	Kerry
Rizokarpaso	.. —	.. No. 54	.. No. 461 ..	Cyprus
Vatili	.. Moleskin	.. No. 56	.. No. 458 ..	Cyprus

Notes : 1.—There are Boars at all the above stations except Vatili, Nicosia and Morphou and he-goats at all stations except Vatili and Morphou; there is a pen of R.I.R. poultry at Ktima, Larnaca, Vatili, Lefkoniko and Ayios Theodoros Stud Stables.

2.—Boars and he-goats may be issued on loan to *bona fide* applicants upon application to the Director of Agriculture or Manager, Stock Farm, Athalassa.

FERTILIZERS

produce good crops

INSECTICIDES & PESTICIDES

protect them

FUMIGATION

rids your citrus fruit and trees of scales
and makes you product easily saleable



**I.C.I. (Levant) Ltd. can advise you on all
agricultural and horticultural problems
and can supply all your needs**

AGENT IN CYPRUS:

O. G. CHAKARIAN,

PAPHOS STREET No. 25,

NICOSIA.

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Basket Making—Mesoyi village—Paphos District.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW
OF THE
AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

Vol. XXXIII, Part 2.

JUNE, 1938.

Price 3p.

EDITORIAL NOTES

THE weather was unsettled during May and there was an unusually cold spell about the middle of the month, accompanied by heavy winds.

Although the production of cereal crops is fairly good the unseasonable weather had an adverse effect on all deciduous fruits and production will be moderate.

The carob crop prospects are good but production will be less than last year. Olive trees are in very good condition.

* * * * *

TRANSFER OF THE PLANT PATHOLOGIST.

Dr. R. M. Nattrass has been selected for transfer in the Colonial Agricultural Service as Senior Plant Pathologist in Kenya. Dr. Nattrass left Cyprus on the 21st May, 1938, on leave pending taking up his new appointment in Kenya in August.

* * * * *

TRANSFER OF THE VETERINARY OFFICER.

Mr. R. M. Gambles has been selected for transfer in the Colonial Veterinary Service as Veterinary Research Officer in Palestine.

It is expected that Mr. Gambles will leave Cyprus early in August.

* * * * *

STUDY LEAVE.

Mr. V. Eleftheriou, Agricultural Assistant, has been selected for a course of training in practical general agriculture at the Kent Farm Institute, Borden, Kent. Mr. Eleftheriou will proceed to England in September and remain at Borden during 1938-39 sessions of the Borden Farm Institute.

* * * * *

DEPARTMENTAL PUBLICATIONS.

The following Leaflets have been printed for general circulation :—

Leaflet (Educational Series) No. 16. "The Carob Tree,"

Leaflet No. 22. "Pests of the Apple Tree,"

AGRICULTURAL SHOWS.

The Annual Animal Show at Peristerona-Piyi held on the 10th April, 1938, was attended by His Excellency the Governor, the Commissioner of Famagusta and the Director of Agriculture.

The final dates of the principal Island Shows for the year 1938 have not yet been fixed, but arrangements are being made to hold the Prodhromos Fruit Show in August, the Lysi Agricultural Show in September and the Paphos District Agricultural Show in October.

Proposals are also under consideration to hold a livestock show at Zodhia and Agricultural Shows at Kythrea and Agros.

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VACCINATION OF SHEEP AND GOATS.

The annual vaccination of sheep and goats against Anthrax was commenced during the first week of May in all districts. Nearly 300,000 animals were treated by the end of that month, 13 vaccinators being employed in eight groups under the supervision of the field Veterinary staff. The assistance readily given by flock-owners in this work is ample testimony of the value of vaccination in the prevention of Anthrax (phlangara). The disease is nowadays unknown in vaccinated sheep and cases in goats occur very rarely whereas it caused an average loss of ten per cent. of the animals each year before wide-scale annual vaccination was adopted.

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WARBLE FLY.

Very satisfactory results were achieved by the work carried out by the Veterinary Service from December to April last for the control of the warble fly of cattle. The work was of a preliminary nature and applied, for demonstration purposes, to only 6,000 cattle in groups of villages in Nicosia, Kyrenia, Famagusta, Larnaca and Paphos Districts. Farmers in these areas report that owing to the absence of the fly they have been able to work their cattle in the fields throughout the day. The Government has approved of a scheme for the extension of this work to all villages in the Colony during next winter and spring. The treatment will be carried out free of cost to the farmers who will be required only to produce their animals at the appointed places. If sufficient co-operation is forthcoming between the owners of cattle and the Veterinary staff it will be possible to eradicate the warble fly completely from the Colony within a short time.

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VETERINARY STAFF CONFERENCE.

A Veterinary staff conference was held at Nicosia from 27th to 30th April.

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CYPRUS SHIPPERS ASSOCIATION.

The Third Ordinary General Meeting of the members of the Cyprus Shippers Association was held at Nicosia on Tuesday, 5th April, 1938. Mr. Z. D. Pierides, Mr. M. Williamson and Mr. G. Poulia were elected members of the council in place of three members who retired from office. The retiring members were Mr. G. G. Pierides, Mr. Z. D. Pierides and Mr. G. Poulia,

MEETING OF THE AGRICULTURAL ADVISORY COMMITTEE.

A meeting of the Agricultural Advisory Committee was held at the Headquarters of the Agricultural Department on Saturday 4th June, 1938.

The Director of Agriculture was Chairman of the meeting and the following members were present: The Registrar, Co-operative Credit Societies, the Superintendent of Agriculture, Mr. N. Nicolaides, Mr. S. Stavrides, Mr. Ch. Ashiotis, Mr. Tewfik Saade and Mehmed Mulla Halil Eff.

The items discussed were:—

- (a) A proposal to hold an Agricultural Show at Nicosia in April, 1939.
- (b) Draft of new Silkworm Industry Protection Law and Rules.
- (c) Progress in connection with anti-soil erosion measures.

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OLD STUDENTS' CLUB CUP.

The Agricultural Association of Agros has been awarded the Old Students' Club Cup for 1938. This cup is awarded annually to the most active village agricultural society or club.

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ARBOR DAY.

Abstract of the total number of Plants and Seedlings issued on the occasion of the 17th Arbor Day, celebrated on the 28th and 30th January, 1938.

DISTRICT	NUMBER OF PLANTS ISSUED TO PUPILS.			NUMBER OF PLANTS SOLD AT THE ARBOR DAY.		
	Fruit trees	Industrial seedlings	Forest seedlings	Fruit trees	Industrial seedlings	Forest seedlings
Nicosia	4,270	2,355	10,957	552	161	1,166
Larnaca	4,816	203	2,426	625	—	234
Limassol	4,208	20	2,266	1,055	—	96
Famagusta	5,230	1,312	9,483	903	50	456
Paphos	5,849	1,200	1,408	981	—	320
		(Vines)				
Kyrenia	1,305	961	2,252	253	10	222
Total	25,678	6,051	28,792	4,369	221	2,494

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LOCUST CAMPAIGN.

The annual locust campaign was completed by the end of May, the quantity of locusts destroyed being rather greater than last year. The "true locust" (*Doclostaurus*) was somewhat more abundant this year but the "tsakrakrida" (*Calliptamus*) again occurred in relatively small quantities only.

SERICULTURAL NOTES.

The rearing of silkworms is now completed and appears to have been satisfactory. Losses from disease owing to the wet and cold weather during the early part of the rearing were very small owing to the precautions taken by rearers, following the advice given by the travelling agricultural officers and by the schoolmistress who carried out demonstration rearings in their schools.

In many villages a shortage of mulberry leaves was experienced and rearers were obliged to buy leaves at 1-1½p. per oke to feed their silkworms.

New cocoons appeared in the market after the 15th May and were purchased by merchants at 9-10p. per oke.

The total quantity of silkworm eggs hatched out and reared this year was about 4,900 ozs. compared with 4,296 ozs. last year.

The total production of cocoons in Cyprus this year is estimated to amount to 115,000 okes approximately.

Demonstrational Silkworm Rearings in Girls' Schools.

Demonstrational silkworm rearings have been carried out in 125 girls' schools during this season and the school girls carried out the various operations in incubation, feeding of the silkworms, etc., under the supervision of the schoolmistresses.

Many private rearers visited the demonstrational rearings in their village schools and saw the improved methods of hatching and rearing the silkworms.

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RACING.

Very successful meetings were held by the Nicosia Race Club on 24th April and 1st May on their new race-course at Ayios Dhometios. The course is a left-handed one of nearly six and a half furlongs and with the Kyrenia hills on the back ground, is ideally situated. Though not altogether level the gradients are not perceptible and the corners are much wider than those on the old course.

The Jubilee Cup was won by "Lady Helen," the property of Mr. Yorgos Savvas of Dhikomo.

Successful village race meetings were held at Vatili on 25th April and 22nd May. The local committee is to be congratulated on the organization of these races which provided a pleasant day's sport for large number of people and at the same time has done much to stimulate interest in horse-breeding.

Diseases of Cattle,

WITH SPECIAL REFERENCE TO CYPRUS.

BY R. MOYLAN GAMBLES, *Veterinary Officer.*

INTRODUCTORY.

CATTLE are susceptible to a large number of serious contagious diseases which cause very heavy losses in the countries where they occur. Fortunately in Cyprus only a very few of these are found among the cattle. The only ones of any importance are Anthrax and Black Quarter. Black Quarter is becoming rare, and Anthrax is now mainly a disease of goats as far as Cyprus is concerned. Also, parasitic diseases, which cause such losses among the sheep and goats, cause little disturbance, if any, in the health of cattle in Cyprus, although they may lead to condemnation of a certain amount of meat, during meat inspection. The reason for this happy state of affairs is probably the comparatively small number of cattle in the Island. The original native cattle of Cyprus, being used to a healthy open-air existence, and not being herded together in overcrowded conditions, or kept on pastures which were overstocked with cattle, probably had few diseases. The conditions under which dairy cattle are often kept are more artificial, and in these, disease is more likely to spread. However, all dairy cattle have been imported fairly recently, and the restrictions imposed on importation, coupled with supervision of recently imported animals, have prevented new diseases being introduced and spread through the Island.

The main losses among the cattle of Cyprus are due to accidental derangements of the digestive, respiratory, urinary and reproductive systems, most of which can be avoided by proper management and feeding, and many of which when they occur can be cured if treated in the right way and early. Unfortunately many weird and wonderful forms of treatment practised by stock-owners in the villages often do more harm than the diseases they are intended to cure. Among these may be mentioned the dangerous practice of cutting the ears, which, if the animal is suffering from Anthrax, will contaminate the pastures with virulent spores, and spread the disease to numbers of other animals which graze there afterwards. Another barbarous form of treatment is the thrusting of sharp sticks up the nostrils. The writer has seen several cases of cattle seriously ill from loss of blood and badly infected wounds of the nasal passages. The owners had adopted this treatment because they believed that the animals had "smelt the trail of a fox" and would die in consequence! Nothing wrong could be found with these animals, except the "cure" performed by the owners!

The following article gives a brief account of the main diseases of cattle, firstly the infectious and contagious diseases caused by specific germs, then those caused by parasites, and lastly those non-contagious affections caused by accidental derangements of the normal functions of the body. Many of these diseases which also occur in sheep and goats have only been dealt with very briefly here, and the reader is referred for fuller information to the Leaflet "Diseases of Sheep and Goats," with special reference to Cyprus" (*Leaflet No. 15, Education Series*).

PART I.—DISEASES CAUSED BY BACTERIA AND VIRUSES.

Anthrax.—This is mainly a disease of sheep and goats in Cyprus, and only occasionally are cattle affected. The infection is caused by a microscopic germ which is swallowed while the animal is grazing. It invades the blood, where it multiplies to enormous numbers. When once the disease is established, the animal dies rapidly. Sometimes the animal is found dead in the stable without having been seen to be ill at all, or falls down and dies in convulsions. Sometimes it is ill for several hours before death, and occasionally (but very rarely) for three or four days. An animal ill with Anthrax will usually grind its teeth, breathe heavily, tremble, and show evidence of abdominal pain. The whites of the eyes are frequently reddened, and there is often a blood-stained diarrhoea, frequently accompanied by much straining. The carcass becomes swollen faster after death than from most other diseases, and there is often a frothy discharge of blood from the nostrils or the anus.

In an animal dead from Anthrax it is important that the carcass should not be opened but be buried whole. In the body the germ is in the "vegetative" stage, and this dies during the putrefaction of the carcass. But as soon as blood is exposed to air, the germs turn into "spores" which are very difficult to kill and may live for as long as twenty years. Thus, when a sick animal is slaughtered or a carcass opened or skinned, spores are spilled on the pasture, or in the stable, and will infect other animals feeding there.

Diagnosis is by the microscopic examination of a drop of blood from a fresh carcass. When the disease is suspected a piece of the ear of the affected animal should be forwarded to the Laboratory. If the ear is tied tightly in two places fairly close together, with two pieces of string, and then cut off between them, little or no blood will be spilt.

No curative treatment is possible, but the disease may be prevented by vaccination.

A fuller account of this disease will be found in the previous Leaflet, "Diseases of Sheep and Goats."

Black Quarter.—This disease is also caused by a germ which lives in the soil, especially in low-lying marshy ground, and infection is spread by failure to dispose of carcasses in a proper manner. In this disease, however, the germ is not spread throughout the body, as in Anthrax, but is usually confined to the local lesion. The affected animal first of all shows a fever, and soon afterwards becomes lame on one leg. Before long, a swelling appears on the affected leg usually near the shoulder or the quarter. When handled the swelling crepitates owing to the presence of gas bubbles in the substance of the muscle and under the skin. In some cases the swelling is in some other part of the body and not connected with the leg. In such a case lameness will not be seen. Sometimes the deeper muscles are the ones affected and in this case the swelling may not be visible externally but the lameness will be evident. Lameness and high temperature always suggest Black Quarter even when the swelling is not observed.

Affected animals nearly always die, so it is not advisable to attempt treatment. If the swelling is opened, germs will be spilt and there is danger of fresh animals being infected. The carcass should be buried deep, without skinning, and covered with lime, if available. In badly affected pastures where Black Quarter is at all common, it is advisable to treat all cattle with a vaccine specially prepared against this disease.

Tetanus ("Lock-jaw").—This disease mainly affects horses, but almost any animal, including man, can be affected. The germ lives in the soil, and is often swallowed by healthy animals while feeding without doing them any harm. But if it gains access to a wound, especially a deep or dirty wound, it forms a powerful poison which affects the nervous system and results in various groups of muscles being thrown into spasms. The first part of the body to be affected is usually the third eyelid, which is drawn across the eye and almost covers it. Then the muscles of the jaw contract and the mouth can only be opened a very little way if at all. Gradually other muscles of the neck, limbs, or back, are involved in the spasms. The head and tail are often thrown upwards with limbs extended, or sometimes the head is bent downwards and the back arched. Occasionally the body is bent towards the side. The spasms continue with increasing frequency and the animal usually dies from exhaustion.

The affected animal should be kept in a quiet dark room with water and food placed within reach. The food must be soft owing to the difficulty of opening the mouth—bran-mash, gruel, finely chopped lucerne, or other green food. If the wound can be found, it should be opened and cleaned out. The dressings from the wound should be burnt, owing to their infective nature.

Prevention is by keeping all wounds clean. Iodine is the best disinfectant against this particular germ. The infection often enters through the navel of the newly-born calf. The navel should therefore always be carefully disinfected after birth. In the case of valuable animals that are wounded it is advisable to inject a prophylactic dose of antitetanic serum.

Contagious Abortion (Bang's Disease).—This is a great scourge of the dairy industry in countries where the disease exists. Fortunately it has been eradicated from Cyprus where it was once introduced with imported stock.

The cow is usually infected by swallowing the germ, either from contaminated pastures, or by licking affected cows which are discharging living germs. Occasionally it is introduced by the bull during copulation. The germ finds its way into the womb, and affects the foetal membranes, thereby causing the death of the calf which is aborted. Affected cows do not always abort. Abortion is commonest in the first one or two pregnancies after infection, and often after that a cow may hold her calf for the full period. But she will still be affected, and the membranes and discharges will be a source of infection to other cows. The foetal membranes are much more liable to be retained by an affected cow than by a healthy one, and sterility is a common sequel. Even if not permanently sterile, an affected cow usually requires to be served more frequently than a normal one before she conceives again.

Various methods of treatment have been attempted, but none of them is of any real use. Prevention is of much more importance. Every aborted foetus and its membranes should be destroyed by burning, and the stable or any other places contaminated by discharges well disinfected. The only real way of controlling the disease is by eradication from the premises. Unfortunately many apparently healthy cows may harbour the disease. However, there is a laboratory test which can be performed on the blood, and will shew which cows are affected. If this is carried out at regular intervals, and all cows which react to the test are removed or slaughtered, the disease can be eradicated from the premises.

Bovine Tuberculosis.—Although the human strain of Tuberculosis is widespread through Cyprus, and the avian strain is met with not infrequently, fortunately the bovine strain, which is the most deadly of all, both for man and beast, has been completely eradicated.

The disease can exist in practically any organ of the body, and the symptoms caused will vary accordingly. Where the lungs are affected, there will be a chronic cough, and the disease will more or less resemble the form it commonly takes in the human subject. Where the intestines are infected, diarrhoea is a frequent result. Tuberculosis of the udder is particularly dangerous from the Public Health point of view, as the milk of a cow infected in the udder will be a source of danger to all who drink it, especially to children. In other organs the disease may just cause the affected animal to grow extremely thin and weak. As the disease no longer exists here, it will not be necessary to describe in detail the many symptoms which may or may not be noticed in each different form of the disease.

There is a test, the "Tuberculin Test," by which affected animals can be discovered, even if the disease does not show externally; and by testing at regular intervals and removing reactors, the disease can be eradicated. All dairy cattle in Cyprus are tested regularly, and no affected animals have been found since 1927. The disease has never been found in native cattle.

John's Disease.—This disease has never been found in Cyprus. It is caused by a germ which lives in the walls of the intestines, making them thick and wrinkled so that scarcely any nourishment can be absorbed through them. The affected cattle become extremely thin and weak, with all their bones showing prominently through the skin, and suffer from a chronic diarrhoea which becomes progressively worse until they die.

Actinobacillosis (Wooden Tongue).—This is a disease caused by a germ which gains entrance to the body through wounds in the mouth or throat, and is usually carried into the tissues by thorns or grass-awns. It causes large fibrous tumour-like growths containing pockets of pus which contains numerous small hard granules. The commonest situation is the tongue, but it can also occur in other soft organs especially the lymph glands, and sometimes the lungs. The tongue increases in size, and may hang out of the mouth. The surface of the swelling often becomes ulcerated. Saliva constantly drips from the mouth, and there may be difficulty in swallowing. The animal is very liable to become constipated, owing to the amount of moisture lost by salivation.

Surgical treatment is usually impossible. The swelling cannot be opened up like an acute abscess as the pus is hidden away in small pockets and the swelling is usually too large to be cut out entirely. However, if the disease is not too far advanced, it can be treated successfully by dosing with potassium iodide or biniodide of mercury.

Actinomycosis (Lumpy-jaw).—This disease is very similar to the previous one, but the germ which causes it usually only affects bony structures, especially the bones of the jaw, which it enters through the empty sockets when the teeth are being changed. The bone swells up and becomes spongy with fibrous growth and pockets of pus in its interior. It is, therefore, less responsive to treatment than Actinobacillosis. Potassium iodide, or Mercury biniodide may prevent the growth becoming larger when given early in the course of the disease, but in advanced cases treatment seldom gives any benefit.

Haemorrhagic Septicaemia (Barbone).—This disease affects cattle and buffaloes, and is caused by a germ similar to that which causes Haemorrhagic Septicaemia in sheep. In the usual form of the disease there is pneumonia, characterized by a heavy laboured breathing, and sometimes diarrhoea which is often bloodstained. There is often a watery swelling under the throat. In very acute cases the animal may die suddenly, before these symptoms have time to develop, and then the disease resembles Anthrax, from which can be distinguished by microscopic examination of the blood. If the carcass is opened, haemorrhages will be noted on the internal organs and under their covering membranes. In the pneumonic form, the chest cavity will usually contain much fluid, and the septa between the lobes of the lungs will be thickened. The disease has never been found in Cyprus.

Cowpox (Variola).—This disease has never been found in Cyprus. It closely resembles Sheeppox, but it is a much less serious illness. It is usually confined to the udder and teats, and is spread from cow to cow mainly by the hands of milkers. The lesion starts as a round red area, and soon a vesicle appears in the middle of it, containing a clear fluid. The vesicle is divided into various compartments, and the middle of it is depressed and attached to the skin underneath. Then the fluid becomes turbid and pus-like, and later the pustule collapses. Each stage takes three to four days. A dry scab is left which falls off after about another ten days, leaving a small round scar underneath.

Waterpox (Varicella).—This resembles Cowpox but is even less severe. There is no preliminary red stage, and the vesicle has only a single cavity, and the centre is not depressed. The fluid remains clear, unless any secondary infection takes place, and there is no pustular stage. The disease has never been found in Cyprus.

Malignant Catarrh.—This is another disease not known from Cyprus. It starts with a running from the eyes and nose which soon turns to a yellowish pus, and the skin underneath becomes purplish red. The whole of the respiratory tract may become involved, and there is sometimes diarrhoea as well. Large numbers of affected animals die.

Rinderpest (Cattle-plague).—In parts of Africa and Asia, this disease is a very serious scourge, but fortunately it does not occur in Cyprus. It is an acute disease with fever and violent diarrhoea with ulceration of the alimentary tract, and often of the respiratory system as well. In the course of a few days, the animal is reduced to mere skin and bone. The disease spreads very rapidly and nearly all affected animals die.

Contagious Pleuropneumonia (Lung-plague).—This is another serious disease not found in Cyprus. It spreads more slowly than Rinderpest, and the course of the disease is much longer. In the early stages there is pain over the side of the chest, and slight fever. Then the breathing becomes painful and rapid and the animal may grunt with each breath. There is a cough, and a discharge from the nose. There may also be diarrhoea. Recovered animals often become carriers of the disease and continue to spread it to healthy ones.

Foot and Mouth Disease.—This is an exceedingly serious disease, chiefly because of the rate at which it spreads rather than in the number of animals that die from it. Affected animals lose condition greatly, and nearly all abort the following year, and thus greater losses are caused than by more fatal diseases which affect a smaller number of animals.

Fortunately it has been absent from Cyprus for over twenty years, and it is to be hoped that it never reappears.

The disease mainly affects cattle, sheep, goats and pigs. It is characterized by the presence of vesicles in the mouth, especially on the dental pad and the tongue, and also on the feet, especially in the space between the toes. At the same time there is a rise in temperature. In cattle the mouth lesions are more severe than the foot lesions. In sheep the foot lesions are the more severe. There is abundant salivation, strings of ropy saliva hanging from the mouth. The vesicles are very painful. They burst and leave superficial ulcers which are clean, clearcut, and heal rapidly. Foot lesions make the animal lame. The feet are often shaken and kicked.

The disease is very easily spread by contaminated foodstuffs, straw-packing, etc., imported from abroad, so the danger of its suddenly appearing in Cyprus must always be borne in mind. Whenever the disease is suspected, it must be notified at once to the nearest Government Veterinary Officer, who will advise what measures are to be taken. No time must be wasted by an owner trying to treat the disease himself.

Rabies (Hydrophobia).—This is mainly a disease of dogs, and fortunately does not occur in Cyprus. It can be transmitted to any species of animal, including cattle, by the bite of a rabid dog. Affected cattle become restless and aggressive, pawing at the ground and stamping, and attacking other animals and man both with horns and teeth.

The Development of Poultry Husbandry in Cyprus.

DURING the past three years there has been considerable interest shown in poultry keeping both among people who regard it as a hobby and among the villagers of Cyprus who keep poultry as a matter of course. This interest is mainly evinced in the greater demand for eggs and chickens or hens from the Government Stock Farm and district stud stables, a demand which it is impossible adequately to supply at present owing to the limited capacity of the Stock Farm for rearing poultry. Nevertheless considerable progress has been achieved as is shown by the following table:—

	1935-36	1936-37	1937-38 (6 months)
No. of eggs produced	9,371	20,313	14,420
No. of eggs sold for hatching ..	847	2,328	2,358
No. of eggs incubated at Athalassa	938	1,740	2,690

The poultry industry at present supplies the local demand for fresh eggs and fowls, but has not yet provided more than a small export trade, the value of which in 1936, the peak year, was nearly £3,500, but fell to only £77 last year. There is probably opportunity for developing this trade but it is the improvement of the quality of poultry products for home consumption which is of more immediate importance.

Breeds.—The local breeds of poultry are very mixed though the two predominant colours are brown (or speckled brown) and black. All the local fowls are small and do not fatten as quickly or as well as imported breeds; neither do they lay so prolifically. Probably there is a fair admixture of imported blood in many of the local birds, especially around Nicosia, resulting from the crossing of the many pure breeds imported and bred at Athalassa with the local breeds.

Since 1934 only three imported breeds, which are considered to be the best for all ordinary purposes, have been retained at Athalassa. They are Rhode Island Red, White Leghorn and Light Sussex. The first appear to be by far the most suitable breed for Cyprus as they come to maturity earlier and lay better than the other two breeds, besides being suitable for fattening.

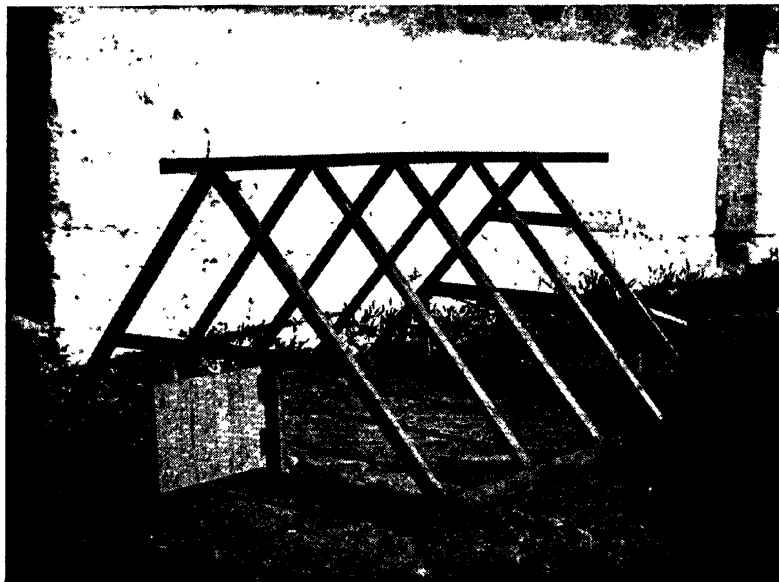
Egg Production.—Trap-nesting was begun in November, 1936, and is now a routine procedure for all hens. Records are now being kept of the date on which pullets begin laying and of their production during their pullet year (*i.e.* for 12 months from the date of the first egg laid) and subsequent years. Pullets which do not lay satisfactorily in the first six months are culled from the flock. Special pens are made up of pedigree birds, the parentage of which was recorded at the time of hatching when the chick was marked (by toe punch) while still in the incubator tray. It thus becomes possible to ascertain the egg yield of pullets compared with their dams and paternal grand dams. At present there are not many such specially bred pullets but the number is increasing.

The average egg production of the three breeds in the first twelve months of trap-nesting has been quoted before and is as follows:—

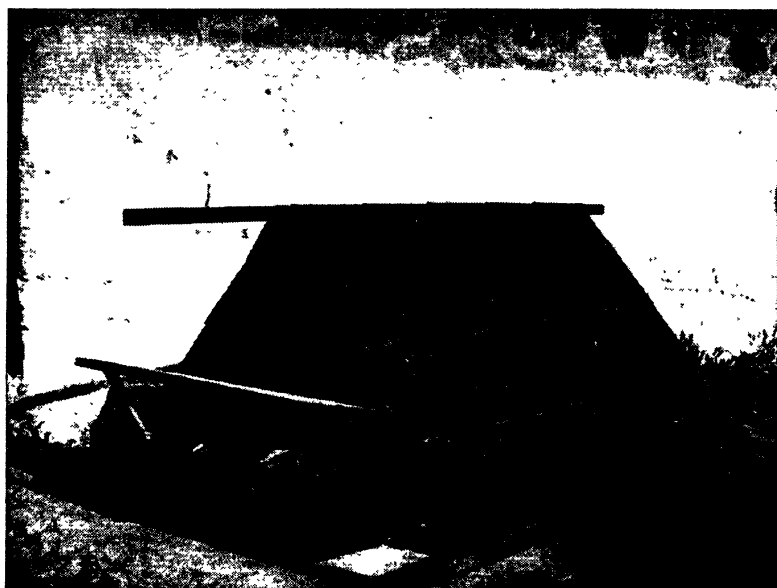
Rhode Island Red..	..	..	150 eggs per bird.
White Leghorn	..	..	139 eggs per bird.
Light Sussex	..	..	131 eggs per bird.

It is estimated that the average production of the local breeds is not more than 60 to 80 eggs in twelve months and a characteristic of these hens is their inclination to become broody after a short period of laying.

Hatching.—It is in the methods of hatching and rearing that increased production can be most easily affected. When natural methods are employed, *i.e.* by using broody hens, the results usually give a high percentage hatchability and, with reasonable care, low mortality among the chicks, but this method is slow and depends on the supply of broody hens. Moreover modern ideas of poultry husbandry demand a hen which will lay as long as possible and not go broody, all replacements of stock being either hatched artificially (*i.e.* in an incubator) or purchased from a hatchery. Some breeds are more inclined to broodiness than others, Light Sussex being an example of the former and White Leghorn the latter. It is a feature of the Stock Farm that all hatching is done in incubators. Results obtained four years ago were poor but since then they have gradually improved until this year the percentage of chickens hatched is 67–68% compared with an average figure of about 75% which should be aimed at. Apart from hatching, however, heavy losses may be sustained in rearing, either from disease, incorrect temperature in the brooder, bad housing and feeding or by accident. It is for these reasons that artificial incubation needs considerably more care than the natural method and cannot be lightly undertaken by anyone without experience and patience. The percentage of chickens reared in relation to the number of eggs incubated was, in 1937, 41% and is a big improvement over the previous three years. Once the chickens are three months old success depends primarily on proper feeding, housing and control (or avoidance) of disease. There are losses which cannot be avoided but with care these should not be heavy.



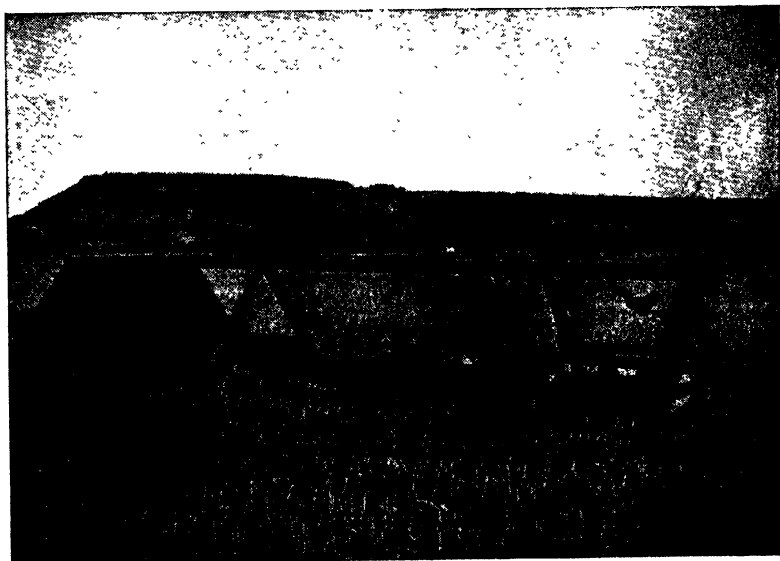
Framework of simple type poultry house.



Completed house as shown in above Photo made entirely of petrol tins.
Note laying boxes at back.



Modern folding unit housing 8-12 birds.



Another view of the folding unit.

Housing.—The housing of poultry in Cyprus is extremely primitive and insanitary and can so easily be improved that it is surprising that it is still so bad. It is probably of more importance than anything else at present to improve housing conditions and a simple type of house is now being demonstrated that can be cheaply made, is easily movable and provides reasonable shelter and protection from cold winds, disease and vermin. A more elaborate type of house and pen and one which is gaining popularity in England is the portable unit in which the house and wire netting run are in one piece and the whole unit is capable of being moved by two persons. This pen is triangularly shaped, the size being approximately 16–20 feet long by 3 feet wide and 3 feet high and accommodates 8–12 adult birds. Such a pen can be made for about £2 in Cyprus. The main advantage of this pen is that it can be moved to fresh ground every day, thereby benefiting both the poultry and the land which is eventually manured. Larger houses either of wood, stone or mud, but preferably of wood can be used. Wooden houses can be more easily cleaned and are movable. They are useful for housing larger flocks of poultry but, if not regularly and thoroughly cleaned, are more liable to become infected with ticks and lice, than the small movable units.

Feeding.—Very little attention is paid to feeding poultry on modern lines in Cyprus and the village hens exist mainly on a ration of barley, a little bran and what they can find in the way of household scraps, etc. It is difficult, however, to recommend a complete ration that is easily obtainable in the villages but the following suggested ration is considered to be an improvement on the usual one :—

Grain : Barley and wheat (or oats) fed night and morning.

Mash : 50% fine quality bran,
25% coarse bran,
25% barley meal.

Preferably fed wet at midday.

In addition it is of great importance that a fresh supply of clean water and of green food is given every day. A small quantity of grit and charcoal is also advisable.

Rations fed at Athalassa differ from the above in that they are more complete and use is made of meat meal, carob meal and minerals which are not easily obtainable everywhere. Wheat and oats are fed as grain, but never barley which is too fattening if fed exclusively.

It can be seen from the foregoing notes that the development of poultry husbandry depends mainly on two things :—

(1) The increasing supply of purebred eggs and chickens both for crossing purposes and for rearing more purebred poultry, and

(2) A general improvement of the conditions under which poultry are reared and maintained. Without this second consideration the first cannot succeed, for the losses among stock will always continue to be high until conditions of management are improved.

Central Experiment Farm, Morphou.

CEREAL AND COTTON TRIALS, 1937.

THE year 1937 was a good average year at the Central Experimental Farm for both cereals and cotton, which form the bulk of the cultivations. The Experimental Plots gave good yields and, in the absence of abnormal climatic conditions, the effects of different treatments and the relative values of different varieties were shown to advantage. The experiments harvested on the farm in 1937 were better laid out than previously and, while no results of great importance can be recorded, a sound basis for future work has been laid down.

WHEAT TRIALS :

1. *Varieties*.—Within the last 10–15 years, over 100 varieties of wheat have been grown in small plots in order to make a comparison with the local varieties. A number of varieties have been eliminated as unsuitable and about 50 were grown and observed during 1937. A controlled experiment was made with eight varieties, these being the three main local varieties, Kyperounda, Psathas, Tripolitiko and B.X.I.P.I. (Palestine), Hamira 436 (Morocco), Huquenot (Morocco), Gluyas Early (Australia), Rietti (Italy). The varieties giving the highest yields, significantly higher than the remainder, were B.X.I.P.I., Gluyas Early and Tripolitiko. These three varieties are suitable for localities round Morphou, but trials are continuing and will be repeated for several years under varying conditions before more definite statements can be made.

2. *Seed Rate*.—A controlled experiment has been carried out for four consecutive years to compare the yield of wheat when sown with different seed rates. No significant differences in yield have been obtained although seed rates between 7 and 15 okes per donum were employed. It appears that the optimum seed rate for wheat has very wide limits and that half a kilé per donum is about correct for average conditions.

3. *Fertilizer Trials*.—Fertilizer trials of various kinds have been carried out for several years. Results confirm the general manurial practice for wheat and can be summarized as follows :—

(a) Nitrogenous manures are of more value if applied in two dressings, e.g. sulphate of ammonia pre-sowing, followed by a nitrate of soda top-dressing.

(b) On irrigated lands, wheat can be grown year after year, and yield a fair crop, if given good dressings of farmyard manure and/or artificials.

BARLEY AND OAT VARIETY TRIALS :

Barley trials indicate that the local varieties Paphitico and Cyprus black are as good as the types so far imported. One imported variety, 4A, is very promising and appears to thrive well in most parts of Cyprus.

It is believed that various imported oat varieties will prove considerably better than the local types, but further trials are necessary to confirm this.

COTTON TRIALS :

1. *Observation Plots*.—Samples of eleven varieties, including eight from Egypt and three from America, were grown in small plots. Each plot was carefully selfed and the varieties were kept pure. The American

varieties were earlier and more vigorous than Egyptian and confirm previous observations that American types are most suited for Cyprus conditions.

2. *Variety Trials.*—A 7×7 "Latin square" experiment was carried out including four American, two Egyptian and Mesowhite varieties. The Egyptian varieties were considerably later in maturing and gave lower yields than the remainder. Varieties Coker 100, Clewewilt 5 and Wilds 7 gave extremely high yields and outyielded Mesowhite. The quality of these varieties is very good, but it remains to be seen whether they will "acclimatize" and remain true to type under Cyprus conditions. Large quantities of seed of Coker 100 and Clewewilt 5 will be available for the 1939 planting and trials are continuing. In general it may be said that Egyptian varieties are inferior to American varieties in yield under Cyprus conditions, but samples of the former are still under trial.

3. *Fertilizer Trial.*—A fertilizer trial was carried out with various combinations of artificial fertilizers in an attempt to find the most economic dressing for irrigated cotton. The cotton was sown on ridges and two spacings, 5" and 10", on the ridges were employed. The results were very inconclusive and no significant differences were shown in either fertilizers or spacings. For the present, until further information on the subject becomes available, a complete fertilizer containing nitrogen, phosphoric acid and potash is recommended.

4. *Date Experiment.*—Results for several years had indicated that earlier plantings for cotton would result in increased yields and in 1937 a complex experiment was laid down comparing three varieties, (Mesowhite, Giza 11 and Gadaz (Indian)), three spacings (5", 10" and 15" apart on the ridges) and three dates of planting (15th of March, April and May). This trial gave interesting results on each subject:—

(a) Mesowhite was a better yielder than the other two, which were the best Egyptian and best Indian varieties introduced up to 1937.

(b) There was no significant difference in the yields of any variety at the different spacings. This fact confirms the observations made in the fertilizer and spacing trial (para. 3) that there are wide limits between which the yield of cotton, planted at different spacings along the ridges, will not vary.

(c) The cotton planted on the 15th of April gave significantly higher yields than that planted on the 15th of March and 15th of May. Of the latter two dates, the 15th of March was much better. Early in April appears to be the best time for planting cotton and May is definitely late.

5. *Irrigation Trials.*—An important factor in cotton growing is the amount of water necessary to give good yields. Plots were laid out in which cotton was irrigated at 15-day intervals with different quantities of water, i.e. 10,000, 20,000, 30,000 and 40,000 gallons per donum per irrigation. The results of the trial showed that the yield steadily increased up to 30,000 gallons per donum per irrigation, but there was no difference between the yields of plots receiving 30,000 gallons per donum per irrigation and 40,000 gallons per donum per irrigation.

Notes on Fungus Diseases.

By R. M. NATTRASS, *Plant Pathologist.*

1. DEFOLIATION OF FIELD BEANS BY CHOCOLATE SPOT DISEASE.

THE "Chocolate Spot" disease of Field Beans in Cyprus occurs to a greater or less extent in most of the bean crops throughout the Island. It has been shown to be caused in Cyprus by the fungus *Botrytis fabae* Sardina. The disease is readily recognized in the field on leaves by the small chocolate coloured spots or lesions which may be from $\frac{1}{2}$ to 4 mm. or more in diameter and round, oval or irregular in shape. Larger lesions may develop a brown centre and be surrounded by a chestnut coloured margin. Two or more lesions may coalesce and involve a considerable area of the leaf, stem or petiole.



Fig. 1.—Mature crop of beans severely attacked by the "Chocolate Spot" disease.

The disease does not normally have any great effect on the crop but under exceptionally favourable conditions, such as an early crop of beans and cold wet spring, it may become a disease of major importance.

An unusually severe attack has been observed during the present year. A crop of beans approaching maturity were so severely attacked as to cause almost complete defoliation and total loss of the crop. The illustration (Fig. 1) shows a portion of the field where all but the topmost leaves had fallen. The fungus itself is not usually seen under field

conditions but in this instance the fallen leaves on the ground were covered with a copious growth of the *Botrytis* fungus which was visible to the naked eye as a grey mould. An adjoining crop about one foot high, was affected by normal "Chocolate spots" the intensity being greatest close to the mature crop from which it had doubtless become infected.



Fig. 2. -Bean plants, showing defoliation by the "Chocolate Spot" disease.

2. LEAF SPOTS OF BEET.

All species and varieties of Beet cultivated in Cyprus are subject to the attack of the fungus *Cercospora* and the small irregular spots and shot holes caused by this fungus are familiar to every grower. The spots caused by this fungus rarely exceed $\frac{1}{8}$ inch and may be sufficiently numerous to kill the leaf.

During the present year a more serious disease has made its appearance on Leaf Beet. It is readily distinguished from the *Cercospora* Spot by the large size of the lesions. They are always more or less circular and may attain a size of $1\frac{1}{2}$ inch in diameter. They usually show

concentric markings and have a pale coloured centre: as these continue to increase in size the centre portion of dead tissue drops out leaving a gaping hole. Two or more lesions may meet involving a large area of the leaf and owing to their large size few lesions are required to render the crop unmarketable.

The disease is caused by the fungus *Phyllosticta* (*Phoma*) *betae* which in other countries causes a heart rot of sugar beet and mangolds. With a pocket lens small black bodies, which are the pycnidia or fruiting bodies of the fungus, can be distinguished. These are absent on the spots caused by the *Cercospora* disease.



Fig. 1.—The *Cercospora* Leaf Spot of Beet.

As the *Phyllosticta* disease is not widely distributed in Cyprus efforts should be made to eradicate it by ploughing in or feeding off the affected crop. It may also be controlled by spraying with Bordeaux Mixture but with Leaf Beet this should not be done except when the plants are in a very early stage.

Both diseases are carried by the seed so only plants in a healthy crop should be left for seed.

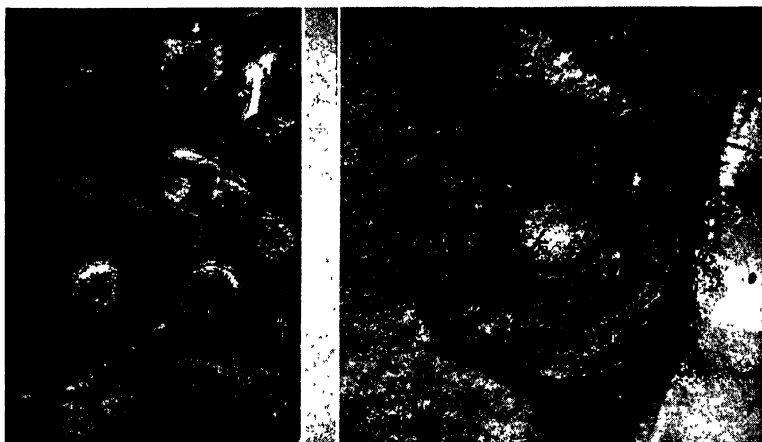


Fig. 2. Left: *Cercospora* Leaf Spot of Beet. Right: *Phyllosticta* Leaf Spot of Beet. Both magnified about 3 times.

Diseases of Cereals—V.

By R. M. NATTRASS, *Plant Pathologist.*

LEAF STRIPE OF BARLEY.

Helminthosporium gramineum.

THE "Stripe" disease of barley, although not so widely distributed as the Leaf Spot or Net Blotch, caused by *Helminthosporium teres*, is one of the most destructive diseases of barley in Cyprus. Like the Leaf Smut of wheat to which it has a superficial resemblance, the whole plant is affected and it is frequently destroyed before reaching maturity. The ear does not usually emerge from the sheath but if it does appear, it is twisted and deformed and contains only shrivelled grains.

The characteristic symptoms are elongated, parallel stripes on the leaves. These usually alternate at first with stripes of healthy tissue, become dark brown in colour and extend the whole length of the leaf. Later the whole leaf becomes brown and dried up, frequently curls downwards and splits into shreds. It will be noted that diseased plants are about half the size of the normal plants and that every shoot of the plant is usually affected.

The disease is caused by the fungus *Helminthosporium gramineum*, the spores of which are produced abundantly on the diseased leaf tissue. They can be seen, with the aid of a pocket lens, as a fine pile on the brown

stripes. These spores are disseminated through the ripening crop where some of the grain becomes contaminated with adhering spores or infected by spores which have germinated and penetrated the tissue of the grains. After such contaminated grain has germinated the fungus also becomes



Fig. 1.—Barley plant affected by "Stripe Disease."

active and the developing shoot is attacked. Each succeeding leaf becomes infected so that the whole plant is affected. The fungus spreads longitudinally between the veins and breaking through produces the characteristic stripes. The disease does not normally spread from plant

to plant in the field, each attacked plant having been infected from the seedling stage. The disease will not therefore appear in crops which have been grown from clean seed.

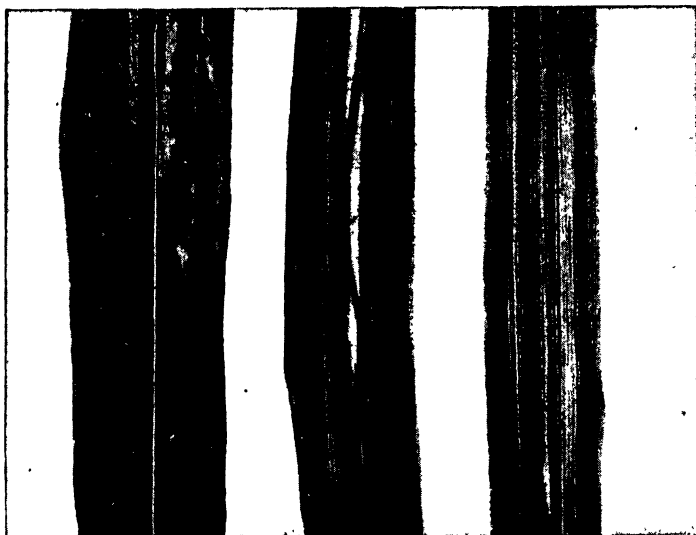


Fig. 2.—Portions of barley leaves attacked by "Stripe disease", magnified by 2.

As the source of infection is carried on the outside of the grain, control measures consist of treating the seed with formalin solution at the rate of $12\frac{1}{2}$ drams in 10 okes of water as described for Covered Smut of Wheat or with one of the proprietary organic mercury dusts. Both these treatments will also control Covered Smut at the same time. The treatment with copper carbonate as recommended for wheat is not suitable.

Agricultural Department Publications.

THE following bulletins and leaflets have been published in English, Greek or Turkish as indicated by the letters *E.*, *G.* or *T.* after each title.

BULLETINS.

Industrial Series :

No. 1.—“The Grape and Wine Industry of Cyprus.” By M. T. Dawe, O.B.E., F.L.S. *E.*

No. 2.—“The Tanning Industry.” By M. T. Dawe, O.B.E., F.L.S. *E.*

Horticultural Series :

No. 1.—“Some Observations on the Citrus Industry of Palestine, with reference to Application of Improved Methods to the Citrus Industry of Cyprus.” By B. J. Weston, M.A., M.Sc., F.R.H.S. *E.*

No. 2.—“Picking, Grading and Packing of Citrus Fruits. A Guide for Exporters.” By B. J. Weston, M.A., M.Sc. (Agr.) *E., G. & T.*

The above two series are now combined and the following have been published :—

No. 3.—“Report on Soil Erosion in Cyprus.” By A. Pitcairn. *E., G. & T.*

No. 4.—“Summary of Agricultural Legislation in Cyprus.” *E.*

Entomological Series :

No. 1.—“Investigations into the Locust Plague in Cyprus.” By Ch. G. Pelagias, I.A. (Gx.), F.A.I. (Gx.), (also *Corrigendum*). *E.*

No. 2.—“A Survey of Olive Pests.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.* (*T.* out of print).

No. 3.—“Insect Pests and Fungus Diseases of Cyprus and their Control.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.*

No. 4.—“Injurious Insects of Cyprus.” By H. M. Morris, M.Sc., F.R.E.S. *E.*

Mycological Series :

No. 1.—“The Control of Fungus Diseases.” By R. M. Nattrass, B.Sc., Ph.D., D.I.C. *E., G. & T.* (*G.* out of print.)

“A first List of Cyprus Fungi.” By R. M. Nattrass, B. Sc., Ph.D., D.I.C. *E.*

LEAFLETS.

No. 1.—“Petroleum Emulsion.” *G.* (Out of print.)

No. 2.—“Boll Worms of Cotton.” *G.*

No. 3.—“Collection, Sorting and Packing of Oranges.” *G.* (Out of print).

No. 4.—“The Cultivation of the Orange Tree.” *G.*

No. 5.—“Carpocapsa” *G.* (Replaced by No. 22.)

- No. 6.—“General Rules for Silkworm Rearing.” *E. G. & T.*
(Reprinted, see also No. 8, Educational Series).
- No. 7.—“Cultivation of Almond Trees.” *G.* (Out of print.)
- No. 8.—“Soil Manuring.” *G.* (Out of print.)
- No. 9.—“Control Measures for Red Scale of Citrus.” *G.* (Out of print.)
- No. 10.—“Seed Beds.” *G.* (Out of print.)
- No. 11.—“The Collection of Sumach.” *G.*
- No. 12.—“The Almond Pest (*Eurytoma amygdali*, End.)” *E., G. & T.*
(Out of print.)
- No. 13.—“Outline of the Rat Destruction Campaign for 1930.”
E., G. & T. (Out of print.)
- No. 14.—“Potato Tuber Moth.” *E., G. & T.* (Out of print; replaced
By No. 17).
- No. 15.—“Warble Flies.” *E., G. & T.* (*E.* out of print.)
- No. 16.—“Downy Mildew of the Vine (*Plasmopara viticola*).” *E., G. & T.*
- No. 17.—“Potato Tuber Moth.” *E., G. & T.* (Replaces No. 14.)
- No. 18.—“The White Rot of Onions in Cyprus.” *G. & T.*
- No. 19.—“The Production of Silage.” *E., G. & T.* (Out of print;
see No. 7 Educational Series.)
- No. 20.—“Importation of Plants, Fruit, etc., into Cyprus.” *E.*
(Reprinted and brought up to date.)
- No. 21.—“*Ceratitis capitata*, Wied. Mediterranean Fruit Fly.”
E., G. & T.
- No. 22.—“Pests of the Apple Tree.” *E., G. & T.* (Replaces No. 5.)

Educational Series :

- No. 1.—“Agricultural Resources of Cyprus.” *E., G. & T.*
- No. 2.—“Breeding, Feeding & Management of Cattle.” *E., G. & T.*
- No. 3.—“Agricultural Calendar.” *E., G. & T.*
- No. 4.—“Linseed (*Linum usitatissimum*).” *E., G. & T.*
- No. 5.—“Sesame (*Sesamum indicum*).” *E., G. & T.*
- No. 6.—“Production of Olives and Olive Oil.” *E., G. & T.*
- No. 7.—“Production of Silage.” *E., G. & T.*
- No. 8.—“Sericulture.” *E., G. & T.*
- No. 9.—“Citrus Fruit Growing in Cyprus.” *E., G. & T.*
- No. 10.—“The Breeding and Management of Sheep in Cyprus.”
E., G. & T.
- No. 11.—“Flax.” *E., G. & T.*
- No. 12.—“Diseases of Poultry.” *E., G. & T.*
- No. 13.—“Irrigation in Cyprus.” *E., G. & T.*
- No. 14.—“Cereal Crops.” *E., G. & T.*
- No. 15.—“Diseases of Sheep and Goats.” *E., G. & T.*
- No. 16.—“The Cultivation of the Carob Tree in Cyprus.” *E., G. & T.*

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The "*Cyprus Agricultural Journal*" is published in March, June September and December.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

Meteorological Data, Cyprus.

SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS.

MARCH, 1938.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	62.90	40.00	0.76	6	0.22	0.74	—
Athalassa	—	—	0.90	4	0.53	0.81	—
Morphou	62.71	40.07	0.48	5	0.15	0.54	—
Makhaeras	—	—	1.70	3	0.80	1.46	—
<i>Famagusta District :</i>							
Famagusta	66.92	38.28	0.28	2	0.20	0.70	—
Akhyritou	63.55	37.55	0.19	3	0.11	0.78	—
Rizokarpaso	—	—	0.90	4	0.40	1.04	—
Lefkoniko	—	—	0.46	4	0.21	0.86	—
<i>Larnaca District :</i>							
Larnaca	64.06	40.35	0.73	5	0.30	0.91	—
Lefkara	—	—	1.13	5	0.50	1.20	—
<i>Limassol District :</i>							
Limassol	64.23	42.68	1.18	11	0.49	1.11	—
Saittas	—	—	1.46	11	0.41	2.03	—
Trikoukkia	46.46	33.20	1.11	5	0.37	2.82	1, 29, 30
Alekhthora	—	—	0.60	5	0.20	0.89	—
<i>Paphos District :</i>							
Paphos	—	—	0.37	4	0.13	1.15	—
Polis	—	—	0.50	4	0.20	1.43	—
<i>Kyrenia District :</i>							
Kyrenia	61.74	46.39	1.97	7	0.92	1.23	—

APRIL, 1938.

<i>Nicosia District :</i>							
Nicosia	73.83	49.23	1.01	6	0.46	0.60	—
Athalassa	—	—	0.95	4	0.46	0.81	—
Morphou	73.00	47.23	1.06	7	0.27	0.49	—
Makhaeras	—	—	2.55	6	1.00	1.01	—
<i>Famagusta District :</i>							
Famagusta	75.24	50.56	1.39	6	0.65	0.51	—
Akhyritou	77.27	48.27	1.54	5	0.63	0.56	—
Rizokarpaso	—	—	0.74	4	0.30	0.55	—
Lefkoniko	—	—	1.08	6	0.52	0.95	—
<i>Larnaca District :</i>							
Larnaca	72.70	50.57	1.60	6	0.75	0.78	—
Lefkara	—	—	2.02	5	0.75	1.09	—
<i>Limassol District :</i>							
Limassol	72.43	50.93	1.94	9	0.75	0.73	—
Saittas	—	—	4.05	9	1.75	1.58	—
Trikoukkia	58.82	41.13	5.58	7	2.12	2.20	—
Alekhthora	—	—	3.10	7	0.98	1.04	—
<i>Paphos District :</i>							
Paphos	—	—	1.55	9	0.78	0.81	—
Polis	—	—	1.18	8	0.50	0.61	—
<i>Kyrenia District :</i>							
Kyrenia	68.29	53.15	1.66	10	0.52	0.88	—

Note.—Compiled from returns furnished by Public Works Department.

MAY, 1938.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	84.10	57.00	1.71	2	1.63	1.13	—
Athalassa	—	—	0.47	3	0.21	0.85	—
Morphou	82.32	51.93	0.16	2	0.12	0.40	—
Makheeras	—	—	1.00	1	1.00	0.89	—
<i>Famagusta District :</i>							
Famagusta	84.29	59.00	0.80	2	0.40	0.35	—
Akhyritou	82.84	54.42	0.20	2	0.10	0.26	—
Rizokarpaso	—	—	0.76	4	0.51	0.83	—
Lefkoniko	—	—	0.71	4	0.35	1.16	—
<i>Larnaca District :</i>							
Larnaca	81.87	54.71	0.50	4	0.20	0.33	—
Lefkara	—	—	0.15	2	0.10	0.31	—
<i>Limassol District :</i>							
Limassol	80.77	55.90	0.25	2	0.15	0.29	—
Saittas	—	—	0.65	5	0.30	1.16	—
Trikoukkia	60.62	44.81	0.25	1	0.25	1.47	—
Alekhthora	—	—	0.70	3	0.60	0.55	—
<i>Paphos District :</i>							
Paphos	72.29	57.55	—	—	—	0.48	—
Polis	—	—	0.50	2	0.40	0.55	—
<i>Kyrenia District :</i>							
Kyrenia	76.26	55.16	0.09	1	0.09	0.63	—

Note.—Compiled from returns furnished by Public Works Department.

The Horse Breeding Law, 1930.

LIST OF STALLIONS LICENSED FOR 1938.

NICOSIA DISTRICT.

Village	Owner's name	Reg. No.
Akaki ..	Michael Th. Rafti ..	29
" ..	Moisis Michael Tchingi ..	203
Argaki ..	Polyvios Theophani ..	153
Astromeritis ..	Christoforos Evangeli ..	26
Kalokhorio ..	Yioryis Papaconstantinou ..	262
Lefka ..	Hussein Djafer Arabadji ..	255
Louroujina ..	Mehmed Youssouf Mukhtar ..	22
Lymbia ..	Andronikos Petri ..	32
Morphou ..	Vasilis T. Spanos ..	18
do. ..	Andreas Ahapittas ..	249
Yeri ..	Yeoryos Petri ..	16
Yerolakkos ..	H. Sofokli ..	194

LARNACA DISTRICT.

Alaminos ..	Rifat Jumaa ..	260
do. ..	Salih Jumaa ..	64
Aradhippou ..	Costis Kyriakou ..	15
do. ..	Lefteris Towli ..	225
do. ..	Andreas Gregori Orphanou ..	277

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Athienou	..	Haris Antoni	..	66
do.	..	Costas N. Haji Vrashimi	..	96
do.	..	Vasilis M. Phiakou	..	159
do.	..	Nicolas Vassili Yiancou	..	276
Larnaca	..	Ipermachos Kyriakou Petroladhas	..	288
Voroklini	..	Panayis Theodosi	..	106
FAMAGUSTA DISTRICT.				
Akanthou	..	Yiannis Hambi	..	270
Asha	..	Antonis Michael	..	92
do.	..	Christos Haji Lavithi	..	234
do.	..	Kyriakos Antoni	..	239
do.	..	Elenkou Prokopi	..	274
do.	..	Michael Yianni	..	285
do.	..	Eleni Demetri Kounalli	..	208
Ayios Andronikos	..	Spyros Yeoryi	..	65
do.	..	Christofis Hambi	..	240
Ayios Elias	..	Constantis Stylli	..	246
do.	..	Yeorgios Christodoulou	..	265
Ayios Seryios	..	Michael Antoni	..	284
Chatos	..	Ahmet Mustafa	..	206
Ephtakomi	..	Loizos Hambaka	..	219
do.	..	Photis Achillea	..	33
Galatia	..	Akil Mustafa Gonie	..	54
Kalopsidha	..	Yeoryios Antoniou	..	267
Kato Varosha	..	Demetris A. Maouris	..	244
Komi Kebir	..	Kyriakos Constanti	..	68
Kondea	..	Christos Hanni	..	259
Lefkoniko	..	Mehmed Salih	..	38
do.	..	Christos Haji Symeou	..	41
Leonarisso	..	Chrysanthos Panayi	..	56
Lysi	..	Minas Lysandrou	..	80
do.	..	Demetris Tophia	..	227
Melanagra	..	Kallis Kyriakou	..	60
Milea	..	Sotira Panayi	..	193
Ovgoros	..	Djafer Emin A. M. Mustafa	..	213
Paralimni	..	Andreas K. Xiouri	..	72
do.	..	Evangelis Haji Vraha	..	172
do.	..	Nicolas G. Tsiakouras	..	210
do.	..	Avraamis Anastasi	..	258
Peristeronopi	..	Andreas Louka	..	45
do.	..	Const. K. Haji Yeoryi	..	73
Phrenaros	..	Kyriakos Theori	..	71
Rizokarpaso	..	Panayiotis K. Sakka	..	171
do.	..	Christofis N. Koulia	..	241
do.	..	Pandelis N. Haji Hari	..	281
Sotira	..	Vasilis Demetri	..	252
Styllos	..	Annezou Nikou	..	269
do.	..	Kyriakos G. Voskou	..	282
Trikomo	..	Marikou Kyriakou	..	224

<i>Village</i>		<i>Owner's name</i>	<i>Reg. No.</i>
Trikomo	..	Kyprianos Stylli Haili	266
do.	..	Eleni Philippou Pieri	279
Vatili	..	Andreas G. Iona	86
do.	..	Vasiliki Haji Christodoulou	89
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ROBERT J. ROM,

Chief Veterinary Officer,

Inspector of Horse Breeding.

6th June, 1938.

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Manager, Stock Farm, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Officer in charge of the Farm.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, including the Nursery Garden, Nicosia, and Officers are stationed at Kythrea, Dheftera and Morphou.

Lefka Sub-District.—Agricultural Officer, Ibrahim Hakki Effendi, is in charge, including Pyrgos area.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA AND LIMASSOL DISTRICTS.

Agricultural Officer, Mr. M. Papaïacovou, is in charge including Larnaca Nursery Garden. Officers are stationed at Larnaca, Skarinou, Nisou, Agros and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Kyprianides, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klockkaris, is in charge. Paphos District includes Paphos and Polis Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelo-kedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant.

Table Showing Distribution of Stud Animals at the Stud Stables and Government Stock Farm, Athalassa on 1st July, 1937.

<i>Station</i>	<i>Stallion</i>	<i>Donkey</i>	<i>Bull</i>	<i>Breed of Bull</i>
Nicosia ..	—	—	Minstrel	Shorthorn
Athalassa ..	Waterkoscie ..	No. 42 ..	Ambassador	Shorthorn
	Kildare Guard ..	No. 38 ..	Monarch ..	Kerry
	Llywnog's Model	No. 55 ..	No. 469 ..	Cyprus
Ay. Theodoros	Pitchford ..	No. 54 ..	No. 460 ..	Cyprus
Larnaca ..	Friars Flutter ..	No. 52 ..	No. 462 ..	Cross-bred
Lefkoniko ..	Marcher Lord ..	No. 48 ..	No. 443 ..	Cyprus
Morphou ..	— ..	..	No. 468 ..	Cyprus
Ktima ..	—	No. 41 ..	No. 497 ..	Native
			No. 453 ..	Kerry
Polis ..	Sonny Boy ..	No. 49 ..	No. 454 ..	Kerry &
			459 ..	Native
Rizokarpaso ..	— ..	No. 50 ..	No. 461 ..	Cyprus
Vatili ..	Moleskin ..	No. 56 ..	No. 458 ..	Cyprus

Notes : 1.—There are Boars at all the above stations except Vatili, Lefkoniko, Nicosia and Morphou and he-goats at all stations except Vatili and Morphou; there is a pen of R.I.R. poultry at Ktima, Larnaca, Vatili, Lefkoniko and Ayios Theodoros Stud Stables.

2.—Boars and he-goats may be issued on loan to *bona fide* applicants upon application to the Director of Agriculture or Manager, Stock Farm, Athalassa.

BOVRIL, LIMITED.

LORD LUKE'S TRIBUTE TO THE LATE SIR JAMES CRICHTON-BROWNE.

Before proceeding with the business of the forty-first Annual General Meeting of Bovril Ltd., held in London on 28th February, 1938, the Lord Luke, K.B.E., the chairman, said he would like to speak of the loss the Company, and indeed the country, had sustained in the death of Sir James Crichton-Browne. It would be impossible to exaggerate the value of his services to the Company, or the admiration his qualities of mind and character had inspired in his fellow directors. At the age of 97 Sir James showed very little diminution of his mental powers. The last thing he did, handicapped as he was by illness, was to prepare the address he proposed to deliver to the shareholders. This it would be his (Lord Luke's) privilege to read to the meeting.

In the address he had prepared, Sir James recalled how in 1897 the great Russian physiologist, Pavlov, had shown that the administration of meat extracts to dogs stimulated the mucosa of their stomachs and produced a copious secretion of gastric juice.

REMARKABLE EXPERIMENTS.

It had been inferred that in human beings these extracts similarly increased the gastric flow, but no scientific proof of this had, until quite recently, been adduced. But during last year, by a remarkable series of experiments at King's College, London, Dr. Boon had demonstrated that meat extracts in varying degrees had the same effect in stimulating the gastric secretion in human beings that they had in dogs and other animals. This was a fact of first-rate importance. A wide range of typical food products was investigated, and it was found that of these Bovril was the most potent and rapid stimulant of the gastric mucosa.

THE BENEFITS OF BOVRIL.

By stimulating the mucosa to an increased flow of hydrochloric acid, Bovril restores the gastric juice to normal and assists recovery. That was an important finding, but the clinical significance of Dr. Boon's discovery was, in the opinion of Sir James, wider still. In such a disease of the stomach as gastritis, which was often the precursor of very serious trouble, there was a deficiency and alteration in the character of the secretion of the gastric juice, a deficiency and alteration which Dr. Boon's results suggested might be corrected by the judicious administration of Bovril, which so powerfully stimulated the secretion of gastric juice containing the essential hydrochloric acid.

It would seem prudent, therefore, for people at, or after, middle life, who suffered occasionally from indigestion, not dietetically explicable, or other gastric disorder, to try the effect of Bovril in warding off the often disastrous consequences of reduced gastric activity.

INCREASED SALES.

The Chairman then went on to review the accounts of a very satisfactory year, during which sales had gone up considerably, both at home and abroad.

The Duke of Atholl, K.T., G.C.V.O., C.B., D.S.O., seconded the adoption of the report and accounts, and the resolution was duly carried,

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Terraced Vineyards at Vouli, Limassol District.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW
OF THE
AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

Vol. XXXIII, Part 3. SEPTEMBER, 1938. Price 3p.

EDITORIAL NOTES

CROP NOTES.

THE weather during the summer months has been exceptionally hot and somewhat unsettled. Dry, hot winds caused damage to the various cereal crops and further reduced production, which is now estimated to be somewhat below average. Threshing of cereals is almost completed.

The summer potato crop sold at very good prices and planting for the winter crop is in progress. Cotton picking has begun but production may be rather poor.

Following the exceptionally large crops of last year, the production of citrus, olive and carob trees is expected to be considerably less this season. The grape harvest should, however, be good.

* * * * *

INTERNATIONAL VETERINARY CONGRESS.

Mr. R. J. Roe, M.R.C.V.S., D.V.S.M., Chief Veterinary Officer, attended as the official delegate of the Cyprus Government the Thirteenth International Veterinary Congress which was held at Zurich and Interlaken, Switzerland, from 21st to 27th August, 1938. Mr. Roe reports that his visit to the Congress was most profitable and that he was also able to gain much valuable professional information by visits to Italian Veterinary Institutions on his journey to Switzerland.

* * * * *

EXPORT OF TABLE GRAPES AND SULTANAS.

Mr. Savvas Michael, Agricultural Assistant, was sent to Crete on 27th July, 1938, in order to study the processes in the preparation of sultanas for export and the methods of packing and shipping table grapes. Mr. Michael, who is expected back on 9th September, reports in unofficial letters to the Viticulturist & Wine Expert that he has been very well received in Crete and that the authorities there have taken much trouble to facilitate the objects of his visit. At the kind suggestion of Dr. Kaloyeras, Mr. Michael was to visit the fruit packing installation at Piraeus on his return journey.

* * * * *

SULTANAS.

The recent exports of sultanas on a fairly extensive scale by Messrs. Cyprus Palestine Plantation Co. of Limassol, mark an important development in this comparatively new Cyprus industry.

AGRICULTURAL SHOWS.

Three successful Agricultural Shows have recently been held.

The first, at Prodhromos on 28th August, was organized by a local committee in co-operation with Mr. K. Hamboullas, Agricultural Assistant. The proceedings combined an Apple Festival with a Fruit and Vegetable Show which were attended by His Excellency the Governor, the Hon. Commissioner, Limassol, and the Director of Agriculture. The opening of the Show by His Excellency was preceded by a programme of events, which included addresses by Medical Officers on the benefits to health to be derived from eating apples. These were followed by poems and a short play extolling the virtues of the apple and its cultivation, and there were also some folk dances.

The standard attained and the variety of fruit and vegetables exhibited spoke eloquently of the possibilities of the area for the supply of such produce, for which there is an excellent demand during the summer tourist season.

The second Show was held at Agros on 3rd and 4th September and was organized by the Agricultural Association of Agros in co-operation with the local Agricultural Assistant, Mr. P. Patsalides, and the Agricultural Officer, Larnaca, Mr. M. Papaiaiovou. His Excellency the Governor, who was again accompanied by the Hon. Commissioner, Limassol, and the Director of Agriculture, opened the Show. He also took the opportunity of presenting to the Agricultural Association of Agros the Silver Cup which is presented annually by the Old Students' Club of the Nicosia Agricultural School to the village agricultural society which has been judged to have been most active in promoting agricultural progress in the preceding year.

A special feature of the Agros Show was a "working model" illustrating, side by side, the correct method of protecting a steep mountain slope against soil erosion and the disastrous effects of neglecting to do so.

The third Show was held at Lysi on 8th September. It had been organized by the Lysi Agricultural Club in co-operation with the Agricultural Foreman, Lysi, Mr. Chr. Avraamides, and the Agricultural Officer, Famagusta, Mr. A. Panaretos. The Show was attended by the Commissioner, Famagusta, the Director of Agriculture, the Chief Veterinary Officer and the Superintendent of Agriculture.

The produce exhibited was fully representative of the crops of the Mesaoria and showed a distinct improvement on that of the 1937 Show. The classes for wheat varieties were particularly strong. A noteworthy feature was an exhibit of table grapes, a crop which has been taken up in the neighbourhood as the direct result of the efforts of the Agricultural Officer, Famagusta.

Livestock entries were good, especially in the class for mares, and some excellent mules were shown. There was a large entry of donkeys.

Before distributing the prizes, the Director of Agriculture took the opportunity of presenting to the Mukhtar, Mr. Souroullas, on behalf of the Lysi Agricultural Club, the replica of the Old Students' Club Cup, which His Excellency the Governor had very kindly provided to be retained by the Lysi Club as a memento of their having won the cup in 1937.

* * * * *

WARBLE-FLY.

As mentioned in our June number, it is intended to begin in December next a campaign against the cattle warble-fly in all parts of the Colony. Leaflets describing the life-history and the damage caused by this pest,

have been distributed. It is hoped that all owners of cattle will appreciate the need for co-operating with the Veterinary Service by producing their cattle for treatment at the appointed places and times.

LIVESTOCK.

The Irish Draught stallion "Kildare Guard" died at the Government Stock Farm on the 23rd July, 1938, from acute oedema of the larynx. This very fine grey horse was much admired by all horse-breeders who saw him and his offspring give every promise of justifying the policy of the Government in introducing this breed into the Colony. Imported in October, 1936, "Kildare Guard" served two mares in that year, sixty in 1937 and sixty-nine in the first half of this year.

Another Irish Draught stallion which has been purchased recently in Eire is expected to arrive in Cyprus in October. Other animals to be imported this year include three Shorthorn heifers and one Large Black boar.

CONTROL OF CITRUS PESTS.

A special campaign of propaganda by means of posters, leaflets and addresses by agricultural staff has been carried out during the last few months, especially in Limassol and Famagusta Districts, to urge on growers the necessity of taking adequate measures for the control of pests. The response has been very gratifying and a marked improvement in the condition of the ripening crop has been reported in consequence. A very satisfactory development as a result of the campaign has been the arrangements made by private companies to carry out spraying for growers.

There are also two companies undertaking fumigation.

CENTRAL EXPERIMENT FARM, MORPHOU.

Co-operation with Normal Training College.

An innovation at the Central Experiment Farm, Morphou, in August, was the employment of twelve students of the Normal Training College in the ordinary work of the farm. These students undertook this work with the praiseworthy object of gaining experience of practical farming which would be of use to them in their future appointments as village schoolmasters. The experiment proved very successful.

AGRICULTURAL COLLEGE OLD STUDENTS' CLUB CUP FOR THE BEST DEMONSTRATION SILKWORM REARING IN A GIRLS' SCHOOL.

This cup has been won for the 1938 season by the Ayios Amyrosios (Kyrenia District) Girls' School (Mistress, Miss Corallia Economidhou), which also won this cup in the 1937 season. The production of cocoons at this school was 10 okes 200 drams from one dram of eggs (equivalent to 84 okes from one ounce of eggs).

DEPARTMENTAL PUBLICATIONS.

The following leaflets have been published in English, Greek and Turkish for general circulation, since the last issue of the Journal :—

Leaflet No. 23	..	..	Citrus Wastage.
do. No. 24	..	..	Pests of Citrus Trees and Fruit.
do. No. 25	..	..	The Ox-Warble Fly.

RACING.

The Nicosia Race Club will hold its Autumn races on 6th and 13th November.

Report on the Citrus Export Season, 1937-38.

By F. B. L. BUTLER, F.L.S., *Chief Grader and Inspector of Produce.*

AS USUAL the citrus season opened with the export of lemons, 24 cases of which were sent to the United States of America. These were "Verdelli" grown and of exceptionally good quality.

The crop in general was rather late in maturing and it was found necessary to prohibit export till early in September, during which month 12,059 cases were shipped, 11,659 to the United Kingdom, 300 to Sweden and 100 to Holland.

The total of 30,899 cases for the season showed a decrease of 52% on the previous season's export. The crop was good, but prices were low, owing to the large quantities shipped from Italy and Spain, and local exporters experienced heavy losses in consequence.

Prices per case in the United Kingdom varied from 5s. to 17s. Purchase prices in the gardens were from 6s. per thousand at Famagusta to 14s. per thousand at Lapithos.

Oranges totalled 324,787 cases, an increase of about 86,258 packages. Of this quantity 231,689 were shipped as "Early Season Fruit" to various destinations. It was reported that the fruit was of poor colour, but good prices were realized.

The United Kingdom market generally was disappointing, low prices prevailing due to the dumping of large supplies, principally from Palestine.

Prices for Cyprus oranges in the United Kingdom ranged from 8s. to 25s. per case.

Purchase prices in the gardens were 22s. to 25s. per thousand at Famagusta, and 21s. to 50s. per thousand at Lefka.

Bitter oranges showed a slight decrease to 2,572 cases as against 2,716 in the last period.

Grapefruit showed an increase of 1,354 cases, the total exported being 1,770 in comparison with 416. It is expected that grapefruit will be exported in rapidly increasing quantities as large new gardens come into bearing, particularly in the Limassol area.

No mandarines or sweet limes were exported and two cases only of citron were sent to the United Kingdom.

GENERAL.

Packing and marking showed a steady improvement, and the number of rejections was markedly less than in previous seasons; an economical system of marking was introduced, in conformation with the Citrus Export Regulations. Reports show that handling in United Kingdom ports has been greatly facilitated thereby.

In spite of the fact that the export of lemons was 28,347 cases less than that of last year, the total citrus exports showed a gratifying increase of 56,300 cases, the respective figures being:—

1936-1937	301,158 packages
1937-1938	357,458 ..

The following tables show the exports month by month, from where shipped, and destinations :—

	<i>Oranges</i> <i>packages</i>	<i>Lemons</i> <i>packages</i>	<i>Bitter oranges</i> <i>packages</i>	<i>Grapefruit</i> <i>packages</i>	<i>Citrons</i> <i>packages</i>
<i>Famagusta Port :</i>	—	—	—	—	—

1937.

September	.. —	.. 12,059	.. —	.. —	.. —
October	.. 38,412	.. 4,359	.. 84	.. 371	.. —
November	.. 183,410	.. 6	.. —	.. 688	.. —
December	.. 17,703	.. 1,953	.. 1,859	.. 30	.. —

1938.

January	.. 18,640	.. 7,180	.. 220	.. 2	.. 2
February	.. 30,012	.. 695	.. —	.. 23	.. —
March ..	.. 8,406	.. 900	.. —	.. —	.. —
April ..	.. 7,725	.. —	.. —	.. —	.. —
May ..	.. 2,819	.. 122	.. —	.. —	.. —
June ..	.. 496	.. —	.. —	.. —	.. —
Total	.. 307,623	.. 27,274	.. 2,163	.. 1,114	.. 2

*Larnaca Port :***1937.**

July ..	.. —	.. 24	.. —	.. —	.. —
September	.. —	.. 306	.. —	.. —	.. —
October	.. —	.. 39	.. —	.. —	.. —
November	.. 1,251	.. 90	.. —	.. —	.. —
December	.. 6,005	.. 36	.. 250	.. —	.. —

1938.

January	.. 615	.. 15	.. —	.. —	.. —
February	.. 2,013	.. 43	.. 100	.. —	.. —
March ..	.. 813	.. 44	.. —	.. —	.. —
Total	.. 10,697	.. 597	.. 350	.. —	.. —

*Limassol Port :***1937.**

September	.. —	.. 98	.. —	.. —	.. —
October	.. —	.. 785	.. —	.. 379	.. —
November	.. 3,003	.. 247	.. —	.. 277	.. —
December	.. 561	.. 326	.. 59	.. —	.. —

1938.

January	.. —	.. 353	.. —	.. —	.. —
February	.. 192	.. 1,032	.. —	.. —	.. —
Total	.. 3,756	.. 2,841	.. 59	.. 656	.. —

		Oranges packages		Lemons packages		Bitter oranges packages		Grapefruit packages		Citrons packages
<i>Paphos Port :</i>		—		—		—		—		—
1937.										
November	..	—	..	15	..	—	..	—	..	—
December	..	1	..	3	..	—	..	—	..	—
1938.										
January	..	—	..	18	..	—	..	—	..	—
March ..	..	3	..	30	..	—	..	—	..	—
April ..	..	5	..	34	..	—	..	—	..	—
Total	..	9	..	100	..	—	..	—	..	—

*Karavostasi Port :***1938.**

February	..	130	..	—	..	—	..	—	..	—
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Kyrenia Port :

May	..	—	..	87	..	—	..	—	..	—
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TABLE SHOWING TOTAL EXPORT MONTH BY MONTH.

		Oranges packages		Lemons packages		Grapefruit packages		Bitter oranges packages		Citrons packages
1937.		—		—		—		—		—
July ..	..	—	..	24	..	—	..	—	..	—
September	..	—	..	12,463	..	—	..	—	..	—
October	..	38,412	..	5,183	..	750	..	84	..	—
November	..	187,664	..	358	..	965	..	—	..	—
December	..	24,270	..	2,318	..	30	..	2,168	..	—
1938.										
January	..	19,255	..	7,566	..	2	..	220	..	2
February	..	32,347	..	1,770	..	23	..	100	..	—
March ..	..	9,222	..	74	..	—	..	—	..	—
April ..	..	7,730	..	934	..	—	..	—	..	—
May ..	..	2,819	..	209	..	—	..	—	..	—
June ..	..	496	..	—	..	—	..	—	..	—
Total	..	322,215	..	30,899	..	1,770	..	2,572	..	2

DESTINATION AND TOTAL QUANTITIES TAKEN BY EACH COUNTRY
DURING THE SEASON 1937-1938.

<i>Country</i>	<i>Oranges packages</i>	<i>Lemons packages</i>	<i>Grapefruit packages</i>	<i>Bitter oranges packages</i>	<i>Citrons packages</i>
United Kingdom	175,256 ..	29,779 ..	1,691 ..	2,222 ..	2
Norway ..	64,299 ..	— ..	67 ..	— ..	—
Sweden ..	40,368 ..	300 ..	— ..	— ..	—
Czechoslovakia ..	10,434 ..	— ..	— ..	350 ..	—
Finland ..	7,875 ..	— ..	— ..	— ..	—
Port-Sudan ..	5,967 ..	14 ..	— ..	— ..	—
Yugoslavia ..	6,415 ..	— ..	— ..	— ..	—
Egypt ..	4,346 ..	455 ..	12 ..	— ..	—
Poland ..	3,692 ..	— ..	— ..	— ..	—
Aden ..	2,486 ..	23 ..	— ..	— ..	—
Italy ..	300 ..	— ..	— ..	— ..	—
Holland ..	261 ..	100 ..	— ..	— ..	—
Belgium ..	200 ..	— ..	— ..	— ..	—
Switzerland ..	140 ..	— ..	— ..	— ..	—
Bulgaria ..	100 ..	— ..	— ..	— ..	—
French Somaliland	14 ..	24 ..	— ..	— ..	—
Malta ..	30 ..	— ..	— ..	— ..	—
Germany ..	23 ..	— ..	— ..	— ..	—
Dodekanesia ..	9 ..	93 ..	— ..	— ..	—
Turkey ..	— ..	87 ..	— ..	— ..	—
United States of America ..	— ..	24 ..	— ..	— ..	—
Total ..	322,215 ..	30,899 ..	1,770 ..	2,572 ..	2

TABLE SHOWING TOTALS AND VARIETY OF CITRUS EXPORTED, 1937-1938.

<i>Kind</i>	<i>Quantity</i>		<i>Period</i>	
	<i>packages</i>		<i>from</i>	<i>to</i>
Lemons ..	30,899 ..	July 2nd, 1937	..	21st May, 1938.
Oranges ..	322,215 ..	Oct. 27th, 1937	..	17th June, 1938.
Grapefruit ..	1,770 ..	Oct. 28th, 1937	..	18th Feb., 1938.
Bitter oranges ..	2,572 ..	Dec. 1st, 1937	..	9th Jan., 1938.
Citron ..	2 ..	—	..	28th Jan. 1938.
Total ..	357,458			

Strong and Healthy Trees that do not bear Fruit.

By K. HAMBOULLAS, *Agricultural Assistant.*

ONE often hears complaints among fruit growers that, although their trees grow quite satisfactorily and look very healthy and vigorous, they do not flower at all or flower very little, and in some other cases that although the trees flower well, very little fruit is set.

In the first instance, that is when the trees are growing vigorously and are in a position to bear but do not do so, the principal cause is excess of nitrogen in the soil.

Such trees are to be found usually growing on soils heavily manured with natural or artificial nitrogenous manures or in places where the soil is naturally rich in nitrogen.

In order to correct the trouble and compel the trees to commence bearing fruit, the following measures should be taken :—

- (1) The application of nitrogen in any form must be immediately stopped.
- (2) A sufficient quantity of superphosphate and potash should be applied.
- (3) Bark-ringing or root-pruning should be carried out.

BARK-RINGING.

The aim in bark-ringing is to conserve the carbohydrates in the upper part of the tree and prevent their expenditure (in combination with nitrogen) in making more and more unneeded growth, and to encourage the accumulation of carbohydrates around the fruit spurs with the consequent better development of the fruit buds.

The carbohydrates are manufactured by the leaves in the process of photosynthesis which takes place during day-time, in the presence of sunlight and through the agency of the green colouring matter, chlorophyll.

The prevention of the descent of carbohydrates and their compounds with nitrogen, is brought about by removing all or part of the bark (through which they normally travel) in the form of a ring or part ring around the stem of the tree below the branches.

Time.—The operation of ringing is carried out when the trees are in flower or just before flowering, and the cut is made right down to the cambium layer.

Methods of Ringing.—Bark-ringing can be carried out by several methods but the best results are obtained from the two following, known as the "Gardner" and "Lees" methods, described by Mr. W. P. Seabrook in his book *Modern Fruit Growing*.

The "Gardner" Method.—This method consists in the removal of two half rings of bark about $\frac{3}{4}$ inches wide, the half rings about 4 inches apart and on opposite sides of the stem.

The two halves are quite separate but the ends of one half ring are vertically above those of the other.

In the case of continued failure to crop and excessive vigour of growth, the ends of the two half rings are made to overlap. In the case of a tree which is not so vigorous, the ends of the half rings are made just to meet. In each case there must be about four inches between the two half rings.

It is important to keep the bark opened.

As the ring joins up it must be reopened the next spring and all the new tissue tending to rejoin the wound must be removed. The freshly

made rings should be painted with an antiseptic to exclude any fungus disease or insect pest from the cut.

"Lees" Method.—The "Lees" Method differs from that of "Gardner" in that the ring is made to encircle the stem entirely, is narrow and heals over the same summer. The normal width of the ring in this case is $\frac{1}{4}$ of an inch instead of $\frac{3}{4}$ and it is allowed to heal up in the same year.

Although both methods are effective the Gardner Method should be preferred.

The Gardner Method was carried out 3 years ago at Asprokremmos on apple trees and quince trees which were not bearing satisfactorily, and the following year they were thus induced to bear very good crops.

Bark-ringing can also be applied in the following cases :—

- (1) On trees which are known to drop their fruit after they are set;
- (2) To break the tree of its biennial habit of fruiting;
- (3) To prevent the trees from growing any larger when they are too closely planted, and
- (4) To give a better flavour and colour to the fruit.

Ringing should not, however, be practised on stone fruits (peach, plum, almond, apricot) as these trees are liable to gumming from the spots where the cuts are made. When dealing with such trees root-pruning should be preferred.

ROOT-PRUNING.

In root-pruning a trench one foot deep and one foot wide is opened all round the tree below the ends of the branches, all roots found are cut off and the trench is filled up again with soil.

The cut made on the roots should be on the slant, upwards, and the cut surface should rest on the soil.

When trees flower well but set little or no fruit, the main reason is insufficient fertilization. This is again due either to the fact that the variety grown is self-sterile or to adverse weather conditions during the flowering period.

In cases where the non-setting of the fruit is due to the self-sterility of the variety grown, one or two more varieties flowering at the same time should be planted in the same orchard or, if there is no room for other trees to be planted, a few branches on every four or five trees grown should be grafted with the suitable variety for cross-pollination.

The majority of fruit varieties and particularly cherry varieties are self-sterile and cannot be fertilized with their own pollen and unless other varieties flowering at the same time are planted close to the desired variety, the results will be very disappointing, as very little fruit will be produced annually.

People who concentrated on one cherry variety, for instance, in villages where cherry-trees were being grown for the first time, had the disappointment of obtaining hardly any fruit from their trees (although the trees flowered well) and consequently thought that their orchard was not suitable for cherries.

To sum-up, therefore, it is inadvisable that growers should concentrate on one variety. They should have a few trees from other varieties flowering at the same time for cross-fertilization, and should keep bees in the orchard to facilitate better pollination. When the non-setting of the fruit is due to adverse weather conditions, late varieties which flower after the heavy frosts are over, should be preferred for planting,

Diseases of Cattle,

With Special Reference to Cyprus.

BY R. MOYLAN GAMBLES, *Veterinary Officer.*
(Continued).

PART II.—DISEASES CAUSED BY ANIMAL PARASITES.

Piroplasmosis (Red-water Fever) *Anaplasmosis* (Gall sickness) and *Theileriasis* (East Coast Fever).—All of these fevers are spread by the bites of ticks, and none of them have ever been found in Cyprus. They are caused by microscopic animal parasites which invade the red blood cells, just as does the Malaria parasite in man, and in the case of East Coast Fever, the cells of the spleen as well. They are all marked by fever, anaemia, and jaundice, and in the case of *Piroplasmosis* there is considerable destruction of red blood cells, leading to reddish or brownish colour in the urine, which is often frothy.

Coccidiosis (Red Dysentery).—This disease is occasionally met with in Cyprus, but is not common. It is usually more serious than *Coccidiosis* of sheep and goats. The parasite (a microscopic animal called a coccidium) invades the wall of the large intestine especially the rectum, which may become intensely inflamed. There is a blood-stained diarrhoea. The faeces contain the parasites, and thus the pastures are contaminated and can infect further cattle. Animals under treatment should therefore be kept in a stable, and all the manure either burnt or buried deeply. The best treatment is the administration of repeated small doses of ferrous sulphate. Dover's powder, also, is sometimes used.

Stomach-worms, etc.—Cattle in Cyprus are not seriously affected by worms in the alimentary tract. The Twisted Wire worm, *Haemonchus contortus*, can occur in cattle just as in sheep, but it is not very common in Cyprus. Cattle are not very readily infected with the Lesser Stomach worm of the sheep, *Ostertagia circumcincta*, but have their own species, *O. ostertagi*. This has never been recorded from cattle in Cyprus. The only worm in the alimentary tract that is at all common is *Gongylonema pulchrum* which is found under the mucous membrane of the oesophagus in nearly all ruminating animals and appears to cause no harm at all. Tape-worms, the same species as in sheep and goats, have occasionally been found, but not in large numbers and do no harm. Stomach-worms can be treated with Copper Sulphate, as in the case of sheep.

Lung-worms.—The only serious lung-worm in cattle is *Dictyocaulus viviparus*, which has never been found in Cyprus. It is doubtful if the common lung-worm of sheep *P. filaria* would be likely to affect cattle, and if it did the effects would not be serious. In countries where the cattle lung-worm occurs, however, it can cause serious losses. Treatment is along the lines advocated for sheep, in the previous article in this series.

Eye-worms.—There is a species of worm, *Thelazia rhodesi*, that lives in the eyes of cattle. This has occasionally been found in Cyprus. Treatment is by surgical operation.

Liver-flukes.—The Liver-fluke, *Fasciola hepatica*, is mainly a parasite of sheep and goats, but it can also occur in cattle. A greater number of parasites are required to harm an ox than to harm sheep, and there are no cases on record of disease being produced in cattle in Cyprus by this parasite, but it may be present in sufficient numbers in the liver to spoil this organ for human consumption, and lead to its condemnation during meat inspection. A description of the parasite and its life history is given in the previous article. As a water snail is required to complete the life-cycle of this fluke, it only occurs in animals grazed in marshy or irrigated areas, and therefore is not widely distributed in the Island. Carbon tetrachloride, the remedy recommended for sheep, is dangerous for cattle which must be treated with Extract of Male-fern instead.

Hydatid Cyst.—The hydatid cysts, which occur in the liver and lungs, are the intermediate stage of a small tape-worm occurring in dogs, *Echinococcus granulosus*. Cattle are affected, as are sheep and goats, by grazing on pastures contaminated by the faeces of dogs which are infested by this tape-worm. When the egg of the tape-worm is swallowed it hatches into a small embryo which bores its way through the wall of the intestine, and passes through the blood stream to the liver or lungs, where it develops into the cyst. Dogs are infected with the worm by feeding on carcasses or on slaughter-house offal containing cysts. If all carcasses of cattle, sheep and goats were buried beyond the reach of dogs, and all offal containing cysts were burnt instead of being thrown to the dogs when animals are slaughtered, this pest could be soon eradicated. Besides the great losses caused by the condemnation of infected meat, the disease constitutes a great danger to man, for any one handling a dog containing the worm is liable to infect his hands with eggs, which often adhere to the dog's coat, and next time he puts his hand to his mouth he may swallow the egg which will give rise to the cyst. In man the cysts are more harmful than in animals, and unless removed by surgical operation, often cause death.

Beef-measles.—Beef-measles are small cysts in the muscles, especially of the heart and tongue, and are the intermediate stage of another tape-worm, *Taenia saginata*, which affects man. Man acquires the tape-worm by eating meat containing the cysts, and the cattle are infected by grazing on pastures which are contaminated by the excrement of man. The condition is the cause of the condemnation of a great amount of beef every year. Control measures consist of the proper inspection of meat, the proper cooking of meat in case any cysts have escaped notice, the construction and use of latrines, and the medical treatment of those who are infected with tape-worms.

Warbles.—Warbles are the maggots of the warble fly of which there are two species found in Cyprus which attack cattle, *Hypoderma lineatum* and *H. bovis*. The flies are on the wing during the spring and early summer months, and lay their eggs on the hairs of the cattle, usually on the lower parts of the legs. The flies are well known to stock-owners owing to the panic they cause among the animals while they are laying their eggs. The eggs hatch into small maggots which bore through the skin of the animal and slowly migrate through the body until they reach the back. By this time the maggots are much larger and lie in round swellings under the skin, with a small hole in the centre, through which they breathe. They lie here during the autumn months, and

between December and March they crawl out through the hole and bury themselves in the soil where they pupate. The adult flies hatch out from the buried pupae after some weeks and recommence the attack on the host.

Warbles cause a great deal of damage to the skins of the animals so that their value as hides is greatly diminished. They do not usually interfere with the health of the animal, but there is always danger of infection gaining entrance through the hole in the skin, and the formation of abscesses. There is also the panic caused to the animals when the fly is on the wing, which in many districts makes animals quite unmanageable, and at the season when the fly is about, work is only possible in the early mornings.

Fortunately warbles can be quite easily eradicated if all owners co-operate. The warbles of cattle do not attack any other species of animal. Also, during the months of December to March, they appear in the backs of the animals in a position where they can be easily killed, either by squeezing them out or by scrubbing the animals' backs with drugs which will kill the warbles. If every owner saw to it that all his cattle were treated during this time, every cattle-warble in Cyprus would be killed, and there would be no trouble the following year.

External Parasites.—The external parasites of cattle found in Cyprus consist of lice (one species of biting-louse and two species of blood sucking lice), and ticks (mostly the Striped-leg Tick, *Hyalomma aegyptium*).

The chief damage done by the lice is the constant irritation they cause when present in large numbers, so that the animals are kept busy rubbing when they ought to be sleeping or feeding peacefully. The amount of blood they suck is negligible. Ticks on the other hand steal a large amount of blood, and the cattle can ill afford to lose this, especially in a country like Cyprus where pasture is not plentiful. Also the bites of the ticks are liable to become infected and form abscesses. In most other countries ticks also act as transmitters of certain diseases, but in Cyprus, fortunately, all such tick-borne diseases appear to be absent.

The remedy for all kinds of ectoparasites is the regular dipping of the animals. In Cyprus, where the numbers of cattle are relatively small, dipping tanks are built of a size that is only suitable for sheep and goats. Cattle however can be washed, or sprayed, with the same dipping solution as is used for dipping the smaller animals. An effective treatment for lice in cattle is to spray or sponge them with a solution of 1 oz. nicotine sulphate in 5 gallons of water.

PART III.—NON-INFECTIOUS DISEASES.

Disturbances of the Digestive Tract, etc.—The digestive tract of ruminating animals is liable to a number of derangements, especially the first stomach, which may get blocked up with too much solid food (impaction), or may become blown up with gas as a result of excessive fermentation of the contents (tympany). Sometimes the muscles of the wall of the first stomach become weakened, and so the organ cannot contract properly, resulting in a general dullness of the animal and loss of appetite (atony). Although more commonly seen in cattle than in other animals, these conditions are common to all ruminating animals and their symptoms and treatment have already been described in the previous article on Diseases of Sheep and Goats, so there is no need for

repetition. However, certain conditions of the digestive tract other than those dealt with previously are often noticed in cattle, and they will be mentioned here.

Choking sometimes occurs in cattle, especially where fed on such foods as green maize, potatoes, etc. Treatment depends on the position where the piece of food has stuck. Where it is high up in the throat it can often be returned to the mouth by gentle massage in an upward direction, or far enough up to be removed from the throat by hand. When this is not possible, the object can usually be removed by passing instruments down the throat, but this should only be carried out by an expert as there is danger of piercing the wall of the oesophagus. When all else fails, it is necessary to operate surgically.

A very obstinate form of constipation is sometimes met with in cattle, in which no dung may be passed for over a week. Salts are the best remedy for this and can be given in large doses (a pound or even a pound and a half, of Epsom or Glauber Salts dissolved in 2 okes or more of warm water), combined with a tablespoonful of ginger to prevent pain during the action of the salts. Plenty of drinking water should be provided in such a case.

Another very serious disturbance occurs when the animal swallows a nail, needle, or piece of wire. At first this is purely an affection of the digestive system, when the nail pierces the stomach. It is usually in the second stomach that such objects collect. Unfortunately at this stage of the affection the symptoms shewn are very slight, and it is seldom possible to recognize the cause unless the animal has been seen to swallow the nail. There is just a loss of appetite, diminution of the milk yield, or some other vague disturbance, which often passes away in a few days followed by an apparent recovery. If the disease could be recognized at this stage it would be possible to remove the nail by surgical operation before it had done any serious harm. But it is not usually until too late that the cause of the condition is recognized. The next symptoms depend on what happens to the nail after piercing the stomach. Its usual course is to pass forward into the heart. When it reaches here, the animal commences to be seriously ill and it is usually too late to carry out any satisfactory treatment. Sometimes the nail may travel to other parts of the body (liver, spleen) or lie loose in the peritoneal cavity. Very rarely it forms an abscess which bursts to the exterior, and the nail comes out. In this case the animal frequently recovers. Serious symptoms are often not shewn until several months after swallowing the nail. There will be renewed digestive disturbances, and an unwillingness to move. The breathing is usually rather laboured, and grunting is frequent. The heart beats faster than usual and the temperature varies greatly from day to day. Where the nail is in the abdominal cavity, the animal tends to lie down much more often than usual. When in the chest cavity, however, it is unwilling to lie down, and spends most of the time standing, until the disease is so far advanced that it is incapable of standing and has to lie down. Death then follows very soon. While standing, the attitude is rather characteristic. The elbows are turned outwards, so that there is less pressure on the inflamed heart. The veins, especially the milk vein and the jugular vein of the neck tend to be prominent, and in the latter the blood can often be seen pulsating even as far up as the angle of the jaw. (A jugular pulse in the lower part of the neck is of no significance.)

When the disease has reached this stage, there is no curative treatment although certain palliative treatments will often prolong the life of the animal for some time. Among these may be mentioned the practice of standing the cow on a sloping board, so that the front legs are at a higher level than the hind ones. Thus the weight of the stomachs pulls them backwards and there is less pressure on the heart. When, as sometimes happens, the head of the nail remains embedded in the stomach wall, and only the point pierces the heart, it is sometimes pulled back out of the heart by this treatment, and the health of the animal improves.

Prevention is more important, and owners should bear in mind the readiness with which cows will eat unusual objects such as nails, pins, and pieces of wire. It is not only those that fall into the food by accident that are swallowed. If a cow sees such an object on the ground she is very likely to pick it up and swallow it intentionally. Loose pieces of wire are often bitten off fences. It is particularly important when any repairs are made to a stable, to see that the carpenter does not leave any nails on the floor when the work is finished. If any broken pieces of wire are noticed on pastures, they should be removed at once, and all fences should be examined regularly and loose pieces taken away.

Pneumonia.—This will only be dealt with briefly, as it was dealt with in the previous article in this series. Cattle are more easily treated than sheep. There is no long fleece to come between the skin and drugs that are applied to the chest, and also there is a larger expanse of chest, so treatment becomes easier. The chief symptoms of the disease are a difficulty in breathing, combined with a high temperature. There is often a cough. In the early stages of the disease there are often shivering fits. Treatment consists of stimulants (brandy is useful if nothing else is available) and small doses of salts with light nourishing food. It is important that the animal should be kept in a dry stable where there is plenty of fresh air but without being too cold. In the early stages of the disease great improvement will result from the application of a mustard plaster. Mustard is mixed with water to form a paste, and this is applied to the sides of the chest which is then covered with thick brown paper, and a blanket thrown over the animal. The plaster can be left on from eight to twelve hours. At any stage of the disease this will give relief from pain, but only in the early stages is it likely to influence the course of the disease. During recovery, the animal requires a long period of rest, and if put to work too soon afterwards, it may become ill again, and more seriously than before.

Metritis (Inflammation of the womb).—Acute metritis is usually the result of a difficult calving, especially where assistance has been given to the animal without due cleanliness having been observed. It may also be caused by foetal membranes being retained, and decomposing inside the womb. Symptoms, treatment, and prevention have been dealt with in the previous article, and as the disease does not differ in cows from the form in which it appears in ewes, repetition is unnecessary. It might be mentioned, however, that in cows even when the acute metritis has been cured, a chronic endometritis, inflammation of the lining membrane of the womb, may persist, and without making the cow appear ill, may prevent her conceiving again. This condition can also occur

without a previous attack of acute metritis. It is especially common in countries in which Contagious Abortion exists. Treatment is along the same lines as for the acute form, but must be repeated at regular intervals over a long period.

Mastitis (Inflammation of the udder).—Two forms of Mastitis occur in cattle. Acute suppurative mastitis, which is similar to the form seen in ewes, and chronic mastitis. Gangrenous mastitis as found in ewes and she-goats, is not found in cattle. Chronic mastitis of cattle is caused by a specific germ, which fortunately does not appear to occur in Cyprus. The udder becomes tougher and more fibrous than is normal, and the milk may sometimes contain flakes or clots. Sometimes the appearance is thin and watery, without flakes. Treatment is by careful infusion of the udder with antiseptics through the milk canal, but this is only safe in the hands of an expert.

Milk Fever.—This disease is only found in dairy cattle, and usually only in those that give a particularly high yield of milk. It occurs when certain salts that naturally occur in the blood are passed into the milk faster than they can be replaced by the body. This usually only happens just after calving. Within twelve hours of calving, the cow becomes uneasy, and makes "paddling" movements with the hind legs, and shortly afterwards falls down, as if paralysed, and soon becomes drowsy, and unless promptly treated, dies. Treatment consists either of the injection of those salts which are missing from the blood, or by temporarily checking the milk supply by inflating the udder with air.

Acetonaemia (Post parturient dyspnea).—This is another disturbance of cattle which sometimes occurs after calving, but after two to four weeks instead of immediately, as with milk fever. There is a sudden drop in the milk yield, accompanied by constipation, and a dullness and loss of appetite. The appetite is often perverted, and the cow will chew dirty straw bedding, etc., although she will not eat her proper food at all. The breath has a sweet sour sickly smell. Treatment consists of a dose of salts, followed by treacle and baking soda in small doses daily. The animal should also be given a little walking exercise daily, as it is believed that lack of exercise is a predisposing cause.

Difficulties in Calving.—This is not a difficult matter if the owner or person in charge has patience and common sense as well as some practical knowledge.

Many dystocias are simple at the beginning but become difficult owing to immediate interference before one is sure what limbs appear first, whether it is one fore and one hind foot or whether they are two fore feet but belonging to different foetuses.

Before giving any assistance the very first thing one should remember is cleanliness. If the two fore feet appear without the head we must not pull them but try and trace where the head is and if it is turned back on side of chest an attempt should be made to bring it in the right position, namely head and fore feet together. Veterinary assistance is always advisable in such cases.

Cleansing or afterbirth.—After calving the cow should be left quiet for some time and then a dose of salts (sod. Sulph. 1 lb and 1 oz. of ginger) be given. If the cleansing has not fallen off 24 hours after calving veterinary assistance should be called upon to remove it by hand.

Review.

Tobacco Intelligence, published quarterly by the Intelligence Branch of the Imperial Economic Committee, 2 Queen Anne's Gate Buildings, London, S.W.1.

This publication is primarily designed to provide a regular service of information concerning tobacco production, consumption and trade in the world generally and in the United Kingdom in particular.

The current number, that for August, 1933, opens with a quarterly summary of items of interest gathered from various parts of the world. Information is given on the latest crop prospects in the United States, the progress of marketing in our African dependencies, exports from various tobacco-growing countries and imports into the United Kingdom.

A special article on "Tobacco Consumption and Marketing in India" contains statistics and information not yet obtainable elsewhere. Particulars are given of the types grown, of area, production, consumption and quantities imported and this is followed by a very interesting account of the various systems employed in marketing the crop and of the newly introduced "Ag mark" grading scheme.

Another article entitled "The Market for Domestic Tobacco in the United States" deals with the manufacture and consumption of tobacco within that country. Although the United States exports during the past six years have averaged 425 million lb., the domestic market is nevertheless of far greater importance to the grower.

The article discusses the demand for the different types of tobacco grown and describes the various purposes for which they are employed.

Details of the United Kingdom import and export tobacco trade and of the trade in unmanufactured tobacco of the principal importing countries are given in later sections of the publication, which concludes with a chapter providing separate reports on the latest crop prospects, marketing and export figures of eight countries. This chapter includes tables of world statistics of area and production for each year from 1930 onwards.

A specimen copy of "Tobacco Intelligence" will be sent gratis and post free to any grower, trader or manufacturer who cares to apply for one to the Imperial Economic Committee whose address is given above.

J. McD.

Table Grapes and Raisins.

By P. CH. ANTONIADES, I.A.(Ml.), C.M.A.(Fs.),
Viticulturist & Wine Expert.

SPAIN is the principal exporter of table grapes, followed by Bulgaria, Italy, Algeria and Greece. Cyprus has at present a very small share in this trade.

The principal producing area in Spain is the district of Granada, where the main varieties cultivated are *Muscat d'Alexandrie* (known in Cyprus as *Malaga*), *Valensi* (or *Panse*), a rather late ripening variety and *Chanes* or *Almeira* grapes, the latest ripening variety (also introduced lately to the Saitta Experimental Vineyard), growing in the district of Almeira. These grapes are chiefly exported to the English market. In general two-thirds of the fresh grapes received by this market come from Spain and Portugal.

The English market prefers grapes with rather large berries, hard skin and hard, slightly sweet flesh; *Sultana* and *Chasselas* are not well placed on this market.

Germany is one of the biggest markets for grapes, the greatest quantity of the fresh grapes imported there coming from Italy and the Balkans (Bulgaria chiefly), France having lost her prominent place on that market after the Great War. The main varieties for which there is a demand in Germany are the *Chasselas* (an early variety) and the *Servan* (a late ripening variety) followed by the well-known table grape *Rozaki* (white) and *Cinsaut* (red), etc., Hamburg being the market for *Muscatel* grapes.

With regard to raisins, the world export trade in which amounts to about 280,000 tons, Greece, the United States, Australia and Turkey are the chief exporting countries while England and Germany are the main importing countries.

PRODUCTION IN CYPRUS.

It is not very difficult to indicate with sufficient precision the area in Cyprus where table grapes and *Sultanas* are cultivated, this cultivation having only started a few years ago and after the establishment of the Experimental Vineyards at Saitta in 1929. Before 1929 there was practically no cultivation of table grapes except the two local varieties *Verico* and *Ophthalmos*, which are cultivated on a small scale in the gardens of Pitsilia, and a few donums of *Sultana* at Stavrovouni. Up to 1937 it is estimated that 664 donums had been planted or grafted with *Sultana* and 296 donums had been planted or grafted with table grapes. (1 acre=3 donums).

The production is still very small, these vineyards being still very young and only a small percentage have started giving a small production: however this production was estimated in 1937 to be 20 tons of fresh *Sultanas* and 8 tons of fresh table grapes.

These vineyards are distributed throughout the Island, and *Sultana* and table grape cultivation is expanding in the lower regions of almost all districts, but more particularly in Famagusta and Limassol Districts, while the *Muscat d'Alexandrie*, a table, raisin and wine variety, is making rapid expansion on the hills of the main wine districts where these grapes are used in wine making.

The plantations of table and raisin varieties are extending every year and judging from the demand for cuttings or rooted cuttings of these varieties it is presumed that in a few years time (less, certainly, than a decade) these will be widely cultivated in the Island and the production will be important. Almost all the soils in Cyprus are suitable for this cultivation, except the very poor and rocky ones where, grafted on the local drought resisting stock, the white *Xynisteri*, may produce satisfactory crops.

The varieties which seem to be actually in favour with the growers and for which there is a great demand, for some of them the demand being far superior to the stock of cuttings now available in the Island, are:—

Muscat d'Alexandrie (*Malaga*),

Rozaki,

Fraoula,

Sideritis, and

Sultana.

FUTURE OF THE CULTIVATION OF TABLE AND RAISIN GRAPE VARIETIES IN CYPRUS.

The cultivation of table grapes and raisin varieties in Cyprus has a promising future owing to the suitable conditions and to the important markets offered to this production.

The local market is undoubtedly considerable with a probability of improvement by the increase of consumption during the winter months. The foreign markets are very important, the proximity of Egypt (whither Cyprus already exports 1,250 tons of common wine grapes every year) and the prospect of entering into the English market, when table grapes and suitable transport are available, are very encouraging.

The cultivation of table grapes therefore can be expanded under the following conditions :—

(1) Very early varieties should be adopted for local consumption and the English market.

(2) Very late varieties, with berries having hard skin and flesh and which keep well on the vine until late in the season and are good for transport, both for the local and the English market.

(3) Mid-season varieties, which transport well, both for the local and English market.

The future of the *Sultanas* is full of hope, the English market being an extremely important one which has, on several occasions, shown its interest in and appreciation of samples of Cyprus *Sultanas*.

PARTICULARS OF THE VARIETIES WHOSE CULTIVATION IS NOW EXTENDING.

Muscat d'Alexandrie or *Malaga*.—A variety which presents great interest and which has a great future in the Island, the growers having themselves appreciated already its merits, is the *Muscat* or *Muscatel d'Alexandrie*, known in Cyprus as *Malaga*.

This variety may be used for various purposes, either in wine-making, where its flavour is sought after, or in raisin-making, or as a table grape. This variety is subject to "coulure" (dropping of the flowers) but in Cyprus and particularly in the vine districts is less subject to this defect than in other places. Its fertility is very great, it produces very heavy yields and resists hot winds and sunburn where it is not irrigated. It has been noted that this variety thrives on all soils and in all parts of the Island. The berries are large and oval, with hard flesh of a greenish colour becoming golden when ripe; the flesh is juicy, with a pronounced muscatel flavour.

In Cyprus this variety commences to ripen from the 2nd fortnight of August and the ripening is prolonged to the end of September according to altitude and locality. It is a good transport grape; must be submitted to short pruning and to rather low shape of vine bush. It is subject to *Oidium* and has to be protected by sulphuring with more care than some other varieties. This variety is very much appreciated everywhere, particularly in England and the Scandinavian countries, either in the form of fresh grapes or sundried raisins.

Rozaki or *Rosaki*.—A vigorous vine which requires long pruning and is resistant to hot winds (sunburn), particularly if it is not irrigated. It requires good and moist soils to give full production. *Rozaki* is to-day the king of the table grapes, keeping the top of the scale in almost all the markets. It forms large bunches with very large and long oval berries, which have a thin skin; it stands long transport and always

commands the top price on all the foreign markets and more particularly the English market. In other words, it is considered now everywhere to be most valuable export variety. It may be used either as a table grape or as a raisin variety. It ripens in the late mid-season (end of September) and bears more heavily on trellises. This variety is of particular interest for Cyprus, as it is the most esteemed table grape on the English market for the mid-season.

Fraoula.—This is a vigorous vine imported from Greece, thriving in good deep soils, of great fertility and giving a heavy yield. It bears beautiful very loose bunches with rather large oval berries having a very thin skin and sweet flesh, does not stand transport well and it requires long pruning. This is a late mid-season variety, greatly in favour in the Island for its beautiful bunches and its heavy yield. It is considered that its value is over-estimated as it does not stand long transport well ; it is, however, of great interest for the local markets or very near ones such as Egypt. A great expansion of its cultivation is not desirable.

Sideritis.—This is a very late variety ripening in November. It was imported from Greece and is not very vigorous but is of good fertility, particularly on trellises. This variety requires deep moist soils or soils which can be irrigated. The bunches are of medium size, regular, with medium sized round berries of a pleasant rosy colour and pleasant taste. The berries have a rather hard skin and flesh, and this variety is excellent for transport and is known and appreciated in England. It requires long pruning. It is a most valuable variety which should be widely cultivated in the Island.

Sultana or *Sultanina*.—This variety is a native of Asia Minor and is well known and widely grown in every viticultural country, where it is grown for the production of the well-known sultana raisins. One of its valuable characteristics is the seedlessness of the berries. It is a vigorous and very productive vine in dry climates such as that of Cyprus, and prefers good, deep and rather light, moist soils ; in other soils it should be grafted on the drought-resistant Cyprus stock, the well-known local white *Xynisteri*. It requires rather long pruning and produces more heavily on trellises.

The bunches are large, long, rather conical and well branched. The berries are rather small or medium sized and oval ; the skin is thin and yellowish green to golden yellow at full maturity ; the flesh is hard and has a pleasant sweet taste. This variety ripens rather early. On account of the pleasant taste of the grape and its earliness and seedlessness, it is a good table grape as well, and as such it is widely used in Egypt, Greece and Turkey. In England, however, although sold on the market as a fresh grape, it is not so much in favour. Its raisins (*Sultanas*) are very well known and sometimes fetch very high prices on the foreign markets.

Other Interesting Varieties.—In addition to the above-mentioned varieties which are now in cultivation in Cyprus, and amongst the good number of table grape varieties under trial at Saitta Experimental Vineyards, the following varieties are of great interest for Cyprus and their study and propagation will be pushed on :—

(a) *Pearl of Csaba*.—Imported from Hungary. An ultra-early white variety ripening at Saitta at the beginning of July. The bunches are of medium size with round, medium-sized berries with hard flesh, which can stand long transport. It is a kind of *Chasselas* with a pleasant muscatel flavour.

(b) *Muscatel "Queen of Vineyards"*.—Imported from Hungary. This is also an early variety, 8–10 days later than *Pearl of Csaba*. It has beautiful bunches, similar to those of *Rozaki*, with beautiful oval berries of a yellow colour, and hard flesh with muscatel flavour. It has a hard skin and can stand long transport.

(c) *Muscat Hamburg*.—One of the best known and most delicious red muscats. It is not a very vigorous vine but bears well and requires short pruning. The berries are rather soft and not very suitable for long transport. The bunches are fairly large, branched and fairly loose. The berries are of medium size, oval to roundish; dark reddish-purple to black with abundant blue bloom; pulp juicy and very sweet, with a delicious muscat flavour. Good for both eating and wine-making.

(d) *Himoniatico*.—An exceedingly late ripening white variety, found occasionally in Cyprus and known under the name "*Himoniatico*", which means a winter grape. It is really a Christmas table grape of excellent keeping quality.

The vine is vigorous, bearing well both with long and short pruning. The bunches are large and beautiful with large round berries which have a thick skin, and travel excellently. This variety has a pleasant sweetish taste, is of a greenish yellow colour at full maturity, and matures at Saitta in December.

Tree-Planting, 1937–38.

At the end of the 1937–38 season there were 125 tree planting areas as compared with 112 at the end of the 1936–37 season. New areas were declared at Larnaca tis Lapithou, Dhenia, Pano Lefkara, Vavatsinia, Kalokhorio, Mazotos, Ghourri, Ay. Kebir, Lefka, Klirou, Malounda, Xyliatos and Trakhypedhoula. The total area now set aside as tree planting areas is approximately 227,000 donums, which is equivalent to 112 square miles. This area is very satisfactory.

The total number of trees planted is estimated to be 296,210 in tree planting areas and 670,414 trees outside tree planting areas. In addition 1,575 donums of vines and 261 donums of acacia were planted in tree planting areas and 3,058 donums of vines and 47 donums of acacia outside tree planting areas.

The figures compared with those for 1936–37, show a decided increase in the number of trees planted in tree planting areas while those planted outside tree planting areas are about the same.

A summary of the trees planted in each district is given in the accompanying table.

The number of trees planted is rather deceptive in that it gives the impression that tree planting is being carried out vigorously. If the number of trees planted is reckoned in terms of area, it is seen that only about 4,700 donums of land in tree planting areas (less than 1/50th of the total area) and only 10,000 donums outside tree planting areas were planted with trees. These figures show that the present rate of tree planting leaves much to be desired. On the other hand, existing trees in tree planting areas are steadily improving and it is mainly for this reason that the existence of tree planting areas is justified.

The planting season was not very good owing to prolonged periods of dry weather and many of the trees planted are believed to have failed,

TREES PLANTED IN TREE PLANTING AREAS (PLANTING SEASON 1937-38.)

District or Beat	Almonds No.	Olivea No.	Carobs No.	Citrus No.	Vines dons.	Misc. fruit trees No.	Acacia dons.	Forest trees No.
Nicosia and Lefka ..	19,200	450	—	1,000	2	670	—	50,000
Kyrenia.. ..	3,530	275	230	230	24	790	—	530
Larnaca and Limassol (Agros, Nisou) ..	118,790	2,740	3,635	1,320	505	1,513	222	5,430
Famagusta	2,402	219	100	195	31	—	39	6,590
Paphos & Ay. Amvrosios	36,958	344	—	355	736½	1,667	—	Total trees, 296,210
Saitta	7,590	—	50	—	214½	1,800	—	Vines (dons.), 1,575
Trikoukkia	15,000	—	—	—	—	—	—	Acacia (dons.), 261
Arminou	10,453	338	—	—	62	798	—	—
Peristerona	800	12	—	—	—	59	—	147
Total	214,723	4,378	4,015	3,100	1,575	7,297	261	62,697

TREES PLANTED IN NON-TREE PLANTING AREAS (PLANTING SEASON 1937-38.)

District or Beat	Almonds No.	Olivea No.	Carobs No.	Citrus No.	Vines dons.	Misc. fruit trees No.	Acacia dons.	Forest trees No.
Nicosia and Lefka ..	59,611	8,669	30	17,858	48½	15,816	—	43,069
Kyrenia	15,320	3,700	420	5,390	70	2,740	—	12,460
Larnaca and Limassol (Agros, Nisou) ..	80,327	8,605	4,803	29,671	1,210	8,824	47	23,653
Famagusta	11,161	15,597	6,394	32,500	393	11,380	—	34,008
Paphos & Ay. Amvrosios	51,423	3,235	—	3,963	746	7,971	—	Vines (dons.), 3,058
Saitta	14,568	50	—	758	407½	1,595	—	Acacia (dons.), 47
Trikoukkia	4,000	—	—	—	—	18,400	—	—
Arminou	9,241	569	—	198	183	187	—	530
Peristerona	580	85	—	785	—	270	—	—
Total	246,231	40,510	11,647	91,123	3,058	67,183	47	113,720

Agricultural Department Publications.

THE following bulletins and leaflets have been published in English, Greek or Turkish as indicated by the letters *E.*, *G.* or *T.* after each title.

BULLETINS.

Industrial Series :

No. 1.—“The Grape and Wine Industry of Cyprus.” By M. T. Dawe, O.B.E., F.L.S. *E.*

No. 2.—“The Tanning Industry.” By M. T. Dawe, O.B.E., F.L.S. *E.*

Horticultural Series :

No. 1.—“Some Observations on the Citrus Industry of Palestine, with reference to Application of Improved Methods to the Citrus Industry of Cyprus.” By B. J. Weston, M.A., M.Sc., F.R.H.S. *E.*

No. 2.—“Picking, Grading and Packing of Citrus Fruits. A Guide for Exporters.” By B. J. Weston, M.A., M.Sc. (Agr.) *E., G. & T.*

The above two series are now combined and the following have been published :—

No. 3.—“Report on Soil Erosion in Cyprus.” By A. Pitcairn. *E., G. & T.*

No. 4.—“Summary of Agricultural Legislation in Cyprus.” *E.*

Entomological Series :

No. 1.—“Investigations into the Locust Plague in Cyprus.” By Ch. G. Pelagias, I.A. (Gx.), F.A.I. (Gx.), (also *Corrigendum*). *E.*

No. 2.—“A Survey of Olive Pests.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.* (*T.* out of print).

No. 3.—“Insect Pests and Fungus Diseases of Cyprus and their Control.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.*

No. 4.—“Injurious Insects of Cyprus.” By H. M. Morris, M.Sc., F.R.E.S. *E.*

Mycological Series :

No. 1.—“The Control of Fungus Diseases.” By R. M. Nattrass, B.Sc., Ph.D., D.I.C. *E., G. & T.* (*G.* out of print.)

“A first List of Cyprus Fungi.” By R. M. Nattrass, B. Sc., Ph.D., D.I.C. *E.*

LEAFLETS.

No. 1.—“Petroleum Emulsion.” *G.* (Out of print.)

No. 2.—“Boll Worms of Cotton.” *G.*

No. 3.—“Collection, Sorting and Packing of Oranges.” *G.* (Out of print.)

No. 4.—“The Cultivation of the Orange Tree.” *G.*

No. 5.—“Carpocapsa” *G.* (Replaced by No. 22.)

- No. 6.—“General Rules for Silkworm Rearing.” *E. G. & T.*
(Reprinted, see also No. 8, Educational Series).
- No. 7.—“Cultivation of Almond Trees.” *G.* (Out of print.)
- No. 8.—“Soil Manuring.” *G.* (Out of print.)
- No. 9.—“Control Measures for Red Scale of Citrus.” *G.* (Out of print.)
- No. 10.—“Seed Beds.” *G.* (Out of print.)
- No. 11.—“The Collection of Sumach.” *G.*
- No. 12.—“The Almond Pest (*Eurytoma amygdali*, End.)” *E., G. & T.*
(Out of print.)
- No. 13.—“Outline of the Rat Destruction Campaign for 1930.”
E., G. & T. (Out of print.)
- No. 14.—“Potato Tuber Moth.” *E., G. & T.* (Out of print; replaced
By No. 17).
- No. 15.—“Warble Flies.” *E., G. & T.* (*E.* out of print.)
- No. 16.—“Downy Mildew of the Vine (*Plasmopara viticola*).” *E., G. & T.*
- No. 17.—“Potato Tuber Moth.” *E., G. & T.* (Replaces No. 14.)
- No. 18.—“The White Rot of Onions in Cyprus.” *E., G. & T.*
- No. 19.—“The Production of Silage.” *E., G. & T.* (Out of print;
see No. 7 Educational Series.)
- No. 20.—“Importation of Plants, Fruit, etc., into Cyprus.” *E.*
(Reprinted and brought up to date.)
- No. 21.—“*Ceratitis capitata*, Wied. Mediterranean Fruit Fly.”
E., G. & T.
- No. 22.—“Pests of the Apple Tree.” *E., G. & T.* (Replaces No. 5.)
- No. 23.—“Citrus Wastage.” *E., G. & T.*
- No. 24.—“Pests of Citrus Trees and Fruit.” *E., G. & T.*
- No. 25.—“The Ox-Warble Fly.” *E., G. & T.*

Educational Series :

- No. 1.—“Agricultural Resources of Cyprus.” *E., G. & T.*
- No. 2.—“Breeding, Feeding & Management of Cattle.” *E., G. & T.*
- No. 3.—“Agricultural Calendar.” *E., G. & T.*
- No. 4.—“Linseed (*Linum usitatissimum*).” *E., G. & T.*
- No. 5.—“Sesame (*Sesamum indicum*).” *E., G. & T.*
- No. 6.—“Production of Olives and Olive Oil.” *E., G. & T.*
- No. 7.—“Production of Silage.” *E., G. & T.*
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- No. 10.—“The Breeding and Management of Sheep in Cyprus.”
E., G. & T.
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- No. 13.—“Irrigation in Cyprus.” *E., G. & T.*
- No. 14.—“Cereal Crops.” *E., G. & T.*
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Meteorological Data, Cyprus.**SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS.****JUNE, 1938.**

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	95.43	66.17	0.03	1	0.03	0.17	—
Athalassa	—	—	—	—	—	0.11	—
Morphou	90.33	60.23	—	—	—	0.03	—
Makhæras	—	—	—	—	—	0.58	—
<i>Famagusta District :</i>							
Famagusta	92.96	67.90	—	—	—	0.18	—
Akhyritou	91.83	63.97	—	—	—	0.18	—
Rizokarpaso	—	—	—	—	—	—	—
Lefkoniko	—	—	—	—	—	0.23	—
<i>Larnaca District :</i>							
Larnaca	90.70	62.37	—	—	—	0.02	—
Lefkara	—	—	—	—	—	0.21	—
<i>Limassol District :</i>							
Limassol	89.60	61.50	—	—	—	0.06	—
Saittas	—	—	0.05	2	0.03	0.62	—
Trikoukkia	77.57	50.43	—	—	—	0.34	—
Alekhthora	—	—	—	—	—	—	—
<i>Paphos District :</i>							
Paphos	78.63	63.67	—	—	—	0.05	—
Polis... ..	—	—	—	—	—	—	—
<i>Kyrenia District :</i>							
Kyrenia	85.13	66.53	—	—	—	0.04	—

JULY, 1938.

<i>Nicosia District :</i>							
Nicosia	98.87	71.06	0.10	2	0.08	0.01	—
Athalassa	—	—	—	—	—	—	—
Morphou	93.00	67.71	—	—	—	—	—
Makhæras	—	—	—	—	—	0.08	—
<i>Famagusta District :</i>							
Famagusta	96.35	74.19	—	—	—	0.01	—
Akhyritou	95.32	69.58	0.10	1	0.10	—	—
Rizokarpaso	—	—	—	—	—	—	—
Lefkoniko	—	—	—	—	—	0.01	—
<i>Larnaca District :</i>							
Larnaca	93.50	67.50	—	—	—	—	—
Lefkara	—	—	—	—	—	—	—
<i>Limassol District :</i>							
Limassol	92.48	67.32	—	—	—	—	—
Saittas	—	—	—	—	—	0.27	—
Trikoukkia	81.07	60.47	—	—	—	0.06	—
Alekhthora	—	—	—	—	—	—	—
<i>Paphos District :</i>							
Paphos	81.42	69.68	—	—	—	—	—
Polis... ..	—	—	—	—	—	—	—
<i>Kyrenia District :</i>							
Kyrenia	88.97	72.16	—	—	—	—	—

Note.—Compiled from returns furnished by Public Works Department.

AUGUST, 1938.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	98.97	72.16	0.95	4	0.75	0.13	—
Athalassa	—	—	1.58	4	0.57	0.18	—
Morphou, C.E.F. ...	93.07	69.64	—	—	—	—	—
Makheras	—	—	2.60	4	1.60	0.26	—
<i>Famagusta District :</i>							
Famagusta	98.61	75.00	—	—	—	—	—
Akhyritou	96.68	71.50	—	—	—	—	—
Rizokarpaso	—	—	—	—	—	—	—
Lefkoniko	—	—	0.73	1	0.73	0.14	—
<i>Larnaca District :</i>							
Larnaca	93.29	70.58	—	—	—	—	—
Lefkara	—	—	—	—	—	—	—
<i>Limassol District :</i>							
Limassol	93.74	68.94	—	—	—	—	—
Saittas	—	—	0.95	4	0.75	0.17	—
Trikoukkia	81.27	60.45	2.86	5	1.05	0.37	—
Alekhtora	—	—	—	—	—	—	—
<i>Paphos District :</i>							
Paphos	81.61	72.13	—	—	—	—	—
Polis	—	—	—	—	—	—	—
<i>Kyrenia District :</i>							
Kyrenia	90.21	73.29	—	—	—	—	—

Note.—Compiled from returns furnished by Public Works Department.

The Horse Breeding Law, 1930.

LIST OF STALLIONS LICENSED FOR 1938.

NICOSIA DISTRICT.			
Village	Owner's name		Reg. No.
Akaki ..	Michael Th. Rafti	..	29
" ..	Moisis Michael Tohingi	..	203
Argaki ..	Polyvios Theophani	..	153
Astromeritis ..	Christoforos Evangeli	..	26
Kalokhorio ..	Yioryis Papaconstantinou	..	262
Lefka ..	Ahmet Doprán Salih	..	255
Louroujina ..	Mehmed Yousouf Mukhtar	..	22
Lymbia ..	Andronikos Petri	..	32
Morphou ..	Vasilis T. Spanos	..	18
do. ..	Andreas Ahapittas	..	249
Yeri ..	Yeoryos Petri	..	16
Yerolakkos ..	H. Sofokli	..	194
LARNACA DISTRICT.			
Alaminos ..	Rifat Jumaa	..	260
do. ..	Salih Jumaa	..	64
Aradhippon ..	Costis Kyriakou	..	15
do. ..	Lefteris Towli	..	225

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Atthienou	..	Haris Antoni	..	66
do.	..	Costas N. Haji Vrashimi	..	96
do.	..	Vasilis M. Phiakou	..	159
do.	..	Nicolas Vassili Yiancou	..	276
Larnaca	..	Ipermachos Kyriakou Petroladhas	..	288
Voroklini	..	Panayis Theodosi	..	106

FAMAGUSTA DISTRICT.

Akanthou	..	Yiannis Hambi	..	270
Asha	..	Antonis Michael	..	92
do.	..	Christos Haji Lavithi	..	234
do.	..	Kyriakos Antoni	..	239
do.	..	Elegou Prokopi	..	274
do.	..	Eleni Demetri Kounalli	..	208
Ayios Andronikos	..	Spyros Yeoryi	..	65
do.	..	Christofis Hambi	..	240
Ayios Elias	..	Constantis Stylli	..	246
do.	..	Yeorgios Christodoulou	..	265
Ayios Seryios	..	Michael Antoni	..	284
Chatos	..	Ahmet Mustafa	..	206
do.	..	Ahmet Kaja Ibrahim	..	285
Ephtakomi	..	Loizos Hambaka	..	219
do.	..	Photis Achillea	..	33
Galatia	..	Akil Mustafa Gonie	..	54
Kalopsidha	..	Yeoryios Antoniou	..	267
Kato Varosha	..	Demetris A. Maouris	..	244
Komi Kebir	..	Kyriakos Constanti	..	68
Kondea	..	Christos Hanni	..	259
Lefkoniko	..	Mehmed Salih	..	38
do.	..	Haji Christos Hepis	..	41
Leonarisso	..	Chrysanthos Panayi	..	56
Lysi	..	Minas Lysandrou	..	80
do.	..	Demetris Tophia	..	227
Melanagra	..	Kallis Kyriakou	..	60
Milea	..	Sotira Panayi	..	193
Ovgoros	..	Djafer Emin A. M. Mustafa	..	213
Paralimni	..	Andreas K. Xiouri	..	72
do.	..	Evangelis Haji Vraha	..	172
do.	..	Nicolas G. Tsiakouras	..	210
do.	..	Avraamis Anastasi	..	258
Peristeronopiyi	..	Andreas Louka	..	45
do.	..	Const. K. Haji Yeoryi	..	73
Phrenaros	..	Kyriakos Theori	..	71
Rizokarpaso	..	Panayiotis K. Sakka	..	171
do.	..	Christofis N. Koulia	..	241
do.	..	Pandelis N. Haji Hari	..	281
Sotira	..	Vasilis Demetri	..	252
Stylos	..	Annezou Nikou	..	269
do.	..	Kyriakos G. Voskou	..	282
Trikomo	..	Marikou Kyriakou	..	224

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Trikomo	..	Kyprianos Stylli Haili	..	266
Vatili	..	Andreas G. Iona	..	86
do.	..	Vasiliki Haji Christodoulou	..	89
Yialousa	..	Christofis Panayi Pitchi	..	280
LIMASSOL DISTRICT.				
Anoyira	..	Thoukis Solomi	..	143
Asgata	..	Demosth. Evangeli	..	119
Ay. Phyla	..	Costis P. Silikiotis	..	118
Limassol	..	Mehmed Mustafa	..	40
Pakhna	..	Theodoros Evgeniou	..	121
do.	..	Haralambos M. Kais	..	283
Phasoula	..	Nicolas Evangelis	..	272
PAPHOS DISTRICT.				
Dhrousa	..	Yiannis Sava	..	139
Istingo	..	Ali Shoukri	..	291
Khoulou	..	Ahmet Kiazim	..	289
Kissonerga	..	Evangelis Haji Nicola	..	126
do.	..	Haji Towlis Haralambou	..	129
Kouklia	..	Mehmed Hassan Kokkinos	..	215
Ktima	..	Veli Tselebis	..	127
"	..	Ali Arif Kallikas	..	290
Kelokedhara	..	G. Christodoulou Sirimis	..	275
Lapithiou	..	Mehmed Mulla Osman	..	263
Lasa	..	Yeoryios Ch. Ellinas	..	130
Pano Arodhes	..	Harilaos Nicolaou	..	136
do.	..	Chrysost. Panayiotou	..	214
Peristerona	..	Solomon Haralambou	..	230
Prodromi	..	Avraamis Sava	..	248
Stroumbi	..	Sofoklis Constanti	..	178
Tala	..	Costis Papa Daniel	..	286
Terra	..	Mustafa Yusuf	..	141
KYRENIA DISTRICT.				
Agri dhaki	..	Haralambos Yianni	..	147
Asomatos	..	Christallou Michaeli	..	146
do.	..	Antonis Haji I. Hanni	..	150
Ayios Amvrosios	..	Nicolas Haji Demetri	..	256
Ayios Yeoryios	..	Costis N. Spanou	..	157
Bellapais	..	Savas K. Demetriades	..	236
Dhiorios	..	Gregoris Haji Michael	..	148
Dhikomo, Kato	..	Loukas G. Loukaides	..	273
Kyrenia	..	Shakir Hussein	..	158
Lapithos	..	Polyk. Panayioti	..	99
Larnaka tis Lapithou	..	Miltiades Constanti	..	152
do.	..	Kleanthis Stylianou	..	287
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1st September, 1938.

ROBERT J. ROE,
*Chief Veterinary Officer,
Inspector of Horse Breeding.*

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Manager, Stock Farm, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Officer in charge of the Farm.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, including the Nursery Garden, Nicosia, and Officers are stationed at Kythrea, Dheftera and Morphou.

Lefka Sub-District.—Agricultural Officer, Ibrahim Hakki Effendi, is in charge, including Pyrgos area.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA AND LIMASSOL DISTRICTS.

Agricultural Officer, Mr. M. Papaiaçovou, is in charge including Larnaca Nursery Garden. Officers are stationed at Larnaca, Skarinou, Nisou, Agros and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Kyprianides, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klokkaris, is in charge. Paphos District includes Paphos and Polis Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelo-kedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant.

Table Showing Distribution of Stud Animals at the Stud Stables and Government Stock Farm, Athalassa, on 1st July, 1937.

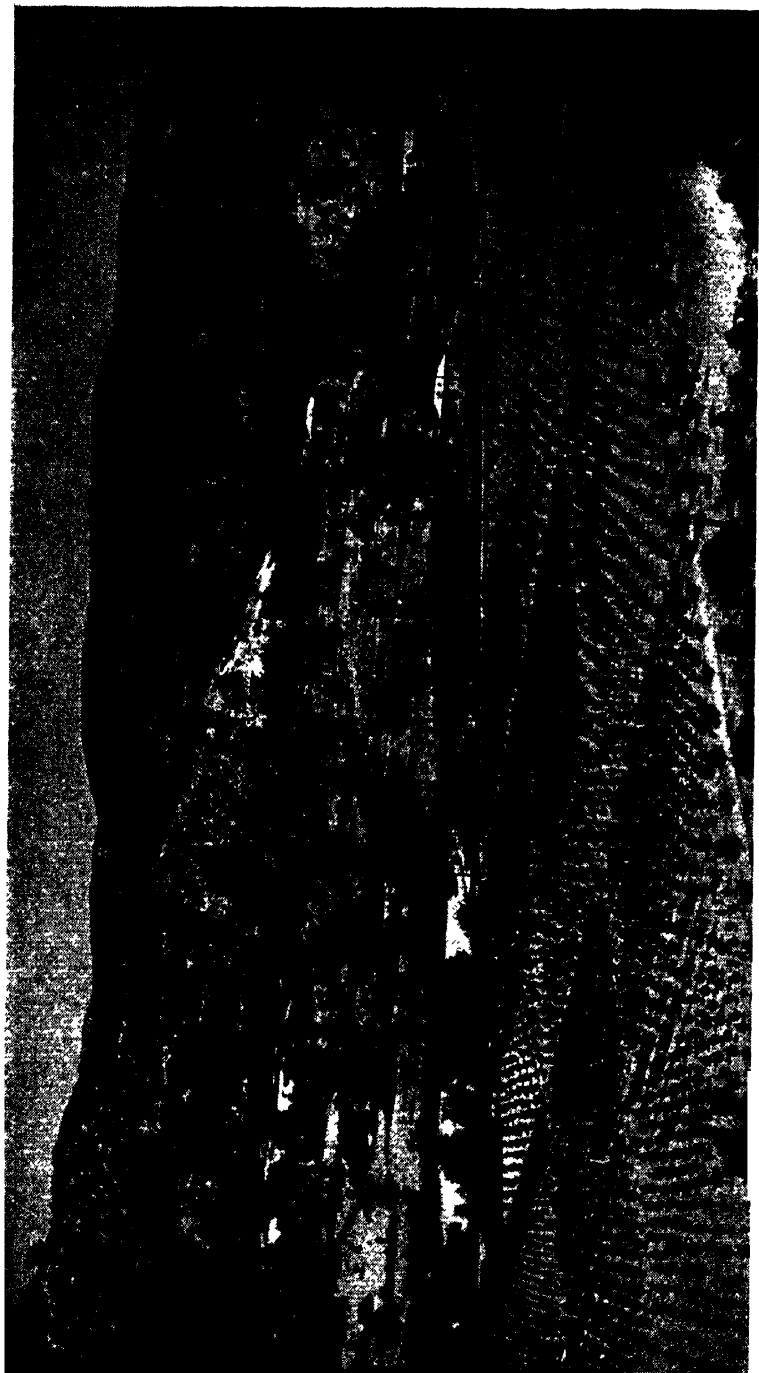
Station	Stallion	Donkey	Bull	Breed of Bull
Nicosia ..	—	—	Minstrel	Shorthorn
Athalassa ..	Marcher Lord ..	No. 38 ..	Ambassador	Shorthorn
	Llywnog's Model	No. 55 ..	Monarch ..	Kerry
			No. 491 ..	Shorthorn
			No. 458 ..	Cyprus
Av. Theodoros	Pitchford ..	No. 54 ..	No. 460 ..	Cyprus
Larnaca ..	Friars Flutter ..	No. 52)	No. 462 ..	Cross-bred
	—	No. 42)		
Lefkoniko ..	Waterkoscie ..	No. 48 ..	No. 443 ..	Cyprus
Morphou ..	—	..	No. 468 ..	Cyprus
Ktima ..	—	No. 41 ..	No. 459 ..	Native
			No. 453 ..	Kerry
Polis ..	Sonny Boy ..	No. 49 ..	No. 454 ..	Kerry
			No. 497 ..	Native
Rizokarpaso ..	—	.. No. 50 ..	No. 461 ..	Cyprus
Vatili ..	Moleskin ..	No. 56 ..	No. 469 ..	Cyprus

Notes : 1.—There are Boars at all the above stations except Vatili, Lefkoniko and Nicosia and he-goats at all stations except Vatili and Morphou; there is a pen of R.I.R. poultry at Ktima, Polis, Larnaca, Vatili, Lefkoniko and Ayios Theodoros Stud Stables; there are turkey-cocks at Athalassa and Ayios Theodoros.

2.—Boars and he-goats may be issued on loan to *bona fide* applicants upon application to the Director of Agriculture or Manager, Stock Farm, Athalassa.

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General view of the Government Vine Experiment Station at Saitta, Limassol.
(*Photo: Edwards Studio, Limassol.*)

The Cyprus Agricultural Journal

A QUARTERLY REVIEW
OF THE
AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

Vol. XXXIII, Part 4. DECEMBER, 1938. Price 3p.

EDITORIAL NOTES

THE early commencement of rains during October favoured the germination of early sown barley and permitted the sowing of wheat under good conditions. Climatic conditions continued favourable during the months of November and December and general prospects are satisfactory.

The viticultural industry suffered a great deal from the early rains. Owing to the exceptional production of grapes, the vintage extended longer than usual. The lowered quality of the grapes will result in poor quality wines.

* * * * *

APPOINTMENT OF BOTANIST AND PLANT PATHOLOGIST.

Mr. L. J. S. Littlejohn has been appointed by the Secretary of State to the Colonial Agricultural Service as Botanist and Plant Pathologist in Cyprus, to fill the vacancy created by the transfer of the Plant Pathologist to Kenya in May this year.

Mr. Littlejohn assumed duties on the 29th September, 1938.

* * * * *

PROMOTION.

Mr. C. C. Koumides, Agricultural Assistant, was appointed on probation an Agricultural Officer as from 7th November, 1938. Mr. Koumides has completed over 13 years service in the Department. He trained for two years in agriculture at Reading University and in recent years has been stationed at the Central Experiment Farm, Morphou.

* * * * *

STUDY LEAVE.

In July, Mr. Savvas Michael, Agricultural Assistant, attached to the Viticultural Section, was granted six weeks study leave to proceed to Greece and Crete to study the preparation of sultanas for export and methods of packing and shipping table grapes. Mr. Michael made good use of his leave and received every possible assistance from the authorities in Greece. A summary of his report is published in this issue,

SAITTA VINE EXPERIMENT STATION.

The frontispiece of this issue is a general view of the Government Vine Experiment Station at Saitta, Limassol District.

Investigations at this station include comparisons of the quality, yield and adaptability of different varieties of table and wine grapes and of the effects of different systems of pruning and planting distances.

* * * * *

SUPPLY OF ROOTED VINE CUTTINGS.

The following quantities of rooted cuttings will be issued from the vine nurseries of the Department of Agriculture for planting in new vineyards this season :—

<i>Variety</i>	<i>Quantity of Rooted Cuttings</i>		<i>Remarks</i>
Rozaki	3,146	..	Table and raisin grape.
Fraoula	4,594	..	Table grape.
Sultana	16,940	..	Sultana and table grape.
Avgoulato	3,314	..	Early table grape.
Akitsi	324	..	Mid season white table grape.
Muscatel	5,607	..	Wine grape.
Malaga	2,306	..	Wine grape.
Lefkas	1,604	..	Wine grape.
Veriko	1,414	..	Local variety of late season table grape.
Aetonychi	1,174	..	Early table grape.
Roditis	772	..	Table grape.
Sideritis	1,472	..	Table grape.
Maratheftiko	500	..	Deep colouring wine grape.

* * * * *

INCREASED DEMAND FOR SULTANA VINE CUTTINGS.

Owing to the developments taking place in sultana production, the supply of sultana vine cuttings is likely to be short of the demand. The Department of Agriculture provides limited quantities each year for sale to small growers. Persons proposing to lay out sultana vineyards on a large scale are advised to make their own arrangements for the supply of planting material. In the event of difficulties in securing sufficient cuttings, application should be made to the Viticulturist, Limassol, for information as to sources of supply.

* * * * *

INCREASED PRODUCTION OF TABLE GRAPE VARIETIES IS RECOMMENDED.

Owing to the overproduction of raisins made from inferior quality wine grapes, which are proving difficult to market, vine growers are advised to consider diverting their energies to the production of Rozaki or other suitable varieties of table grapes. The market for fresh grapes of the best table varieties is a remunerative one and the Rozaki grape has the advantage of producing a better quality raisin.

DECIDUOUS FRUIT STATION, TRIKOUKKIA.

Applications have been received from fruit growers for the supply of budded trees for the 1938-1939 planting season as follows :—

Apple trees	..	..	..	..	800
Pear	„	..	..	..	400
Peach	„	..	..	..	150
Cherry	„	..	..	..	760
Plum	„	..	..	..	390
Apricot	„	..	..	..	850
Kaisha	„	..	..	..	80
Total	..	..	..	..	<u>3,430</u>

The demand has been met except for cherry trees applications for which were slightly in excess of the supply.

Soft fruit recently introduced for trial at this station include different varieties of gooseberries, raspberries, loganberries and blackberries.

ARRANGEMENTS FOR THE SUPPLY OF GRAFTED FRUIT TREES AND ROOTED VINE CUTTINGS FROM THE STATIONS AND NURSERIES OF THE AGRICULTURAL DEPARTMENT.

Fruit and vine growers are reminded of the following arrangements which are in force for the issue of grafted fruit trees and rooted vines from the Government nurseries.

All applications received during the year are recorded in the order in which they are received. Applicants are notified in advance how far their requests can be met and distribution takes place after a fixed date from the various stations as follows :—

Trikoukkia Deciduous Fruit Station.—Applications are considered up to 20th November and issues of available stocks take place between 15th and 30th December each year.

Vine Nurseries.—Applications for the supply of rooted vines are considered up to 10th November each year and issuing commences from the 1st January.

Citrus Trees from District Nursery Gardens.—Applications are considered up to the 1st February and issues commence from the 15th February.

Nursery stock other than citrus, vines and deciduous fruit trees are issued at any time at the discretion of officers in charge of nursery gardens.

The prices charged for grafted trees and rooted vines are :—

Citrus fruit trees, each	..	..	..	..	4½ piastres.
Deciduous fruit trees, each	..	..	..	..	4½ piastres.
Vines, each	..	..	..	..	5 paras.

COTTON PRODUCTION.

The Assistant Director of Agriculture, Mr. A. Pitcairn, attended the Third Conference of the Empire Cotton Growing Corporation which was held in London on the 23rd and 24th September, 1938. A memorandum on the place of cotton in mixed farming in Cyprus was presented to the Conference by Mr. Pitcairn and the points raised on it were fully discussed. This Department's policy of aiming at producing one variety only in the Island received some useful support from a number of delegates with wide experience on cotton-growing problems.

* * * * * * *

CITRUS EXPORTS.

The production and export of citrus fruits shows a steady increase. The following is a comparison between the shipments during the months of October and November, 1938, and the previous year:—

		<i>Oranges.</i>		<i>Lemons.</i>		<i>Grapefruit.</i>		<i>Bitter Oranges.</i>
		<i>cases</i>		<i>cases</i>		<i>cases</i>		<i>cases</i>
1938								
October	..	33,413	..	12,785	..	7,915	..	—
November	..	223,940	..	3,694	..	2,371	..	1,890
Total	..	257,353	..	16,479	..	10,286	..	1,890
1937								
October	..	38,412	..	5,144	..	750	..	—
November	..	187,644	..	5,183	..	965	..	84
Total	..	226,056	..	10,327	..	1,715	..	84

IMPORT OF NEW STUD ANIMALS.

The Irish Draught stallion "Coolderra Bright Boy" purchased in Ireland at a cost of £152 arrived in the Colony in October, together with three Dairy Shorthorn heifers to augment the herd at the Government Stock Farm.

The stallion is just over two years old and should prove of great value in continuing the policy of imparting greater size and strength to the horse stock of the Island.

The heifers come from the Lockinge herd of Mr. Thomas Lloyd of Wantage, Berkshire, and are of excellent pedigree. Two of the heifers are related to the bull "Foxhill Masterpiece," bred by the Hon. E. A. Fitzroy, which was exported to South Africa at a very high figure.

A large black boar "Stokehamdon Enterprise" arrived in the Colony at the beginning of this month. He also will be retained at the Government Stock Farm for stud purposes.

STOCK FARM AUCTION SALES.

A successful auction sale was held at the Government Stock Farm on 12th November when stock sold realized the following prices :—

	£	s.	p.
1 mule	23	10	0
1 crossbred cow in calf	27	0	0
1 crossbred heifer	10	15	0
2 crossbred bullocks averaged	6	7	4
4 bull calves averaged	4	8	0
10 ewes averaged	1	3	2
11 rams averaged	1	13	0
8 he-kids averaged	—	13	6
10 young boars averaged	1	10	0
50 head of poultry averaged	—	4	0

* * * * *

THE OX WARBLE FLY.

An Order published in the *Cyprus Gazette* of the 25th November requires that all cattle in the Colony shall be treated for the destruction of the larvae of the ox warble fly not less than once each month from December to April inclusive. The treatment will be carried out by the Veterinary Service free of charge. Owners of cattle are required to produce them for treatment at places and times to be notified by the Veterinary Officers or dressers.

The aim of this Order is to bring about a considerable reduction in the incidence of the warble fly, and it is possible that repetition of the work during the same months in two subsequent years will result in the total eradication of the pest.

The treatment will consist in dressing the backs of warble-infested cattle with a preparation of *derris*, a plant of well-known insecticidal value which is quite harmless to animals. The control of the warble fly by similar methods is being attempted by Great Britain, Eire, Denmark and many other countries, the treatment being carried out by the owners of the cattle. Cyprus is probably the first country to deal with the pest as a Government measure to be applied to all cattle and to be carried out directly by the Government Veterinary Service, and the results of the scheme will be followed with interest by other countries in many of which the financial loss caused by the warble fly amounts to several million pounds per annum.

* * * * *

OBITUARY.

The news of the death of Ibrahim Hakki Eff., Agricultural Officer, which occurred at Lefka on the 6th November, 1938, was received with regret by all officers in the Department of Agriculture. Hakki Eff. had completed 24 years in the service of the Department.

Summary of a Report on the Sultana and Table Grape Industries in Crete.

BY SAVVAS MICHAEL, *Agricultural Assistant, Viticultural Section.*

THE following preliminary brief outline of the general conditions prevailing in Crete is given :—

The Island of Crete is located in a favourable position on the Mediterranean trade routes between Europe and North Africa. The Island is divided into four Districts with a total area of approximately 3,327 square miles and a population of about 450,000. The climate resembles to some extent that of Cyprus. During the summer months the winds are very hot and, when prolonged, may prove very destructive to agricultural crops. The following meteorological data for the area of the Messara Agricultural School for the year 1937 are given :—

<i>Months</i>			<i>Rainfall</i> <i>millimetres</i>	<i>Average temperature</i> <i>(°C.)</i>		
January	..	..	74.4	..	..	9.3
February	..	..	86.9	..	..	12.8
March	..	..	29.1	..	..	14.9
April	..	..	19.0	..	..	22.0
May	..	..	6.1	..	..	20.3
June	..	..	—	..	..	27.3
July	..	..	—	..	..	31.5
August	..	..	—	..	..	28.8
September	..	..	8.7	..	..	26.0
October	..	..	65.9	..	..	20.1
November	..	..	232.3	..	..	11.9
December	..	..	127.4	..	..	10.7
Total	..	..	649.8			

The soils are similar to those of Cyprus. The mountain ranges are rocky and almost barren.

History.—According to mythology, Jupiter was born in Crete and it is said to have been the country of Minos and Rathamandes, who were the Judges of Adhes. The excavations carried out at Knossos, Festos and other places in Eastern Crete reveal that the people who inhabited the Island some 4,000 to 5,000 years ago made such great progress that they were considered the torch carriers of civilization in the East and the fathers of Greco-Minoic civilization. The exhibits lying in the Museum at Candia testify the wonders of the Minoic civilization. The invasion of the Island by Doridhes put an end to this remarkable civilization when the Island was divided into a number of small states. The Island then passed successively into the hands of the Romans, Byzantines, Arabs, Venetians and Turks and finally came under Greek rule in 1912.

AGRICULTURE.

Owing to its chequered existence Crete made no agricultural progress until 20 years ago. Olive trees constituted the main and only item of agricultural enterprise. The olive tree has been cultivated in Crete since prehistoric times. Since 1923 a remarkable agricultural and industrial development in the Island has taken place on an extensive scale, particularly in regard to the cultivation of sultanas and table grapes. This is accounted for by the great influence of refugees from Asia Minor, who were experienced in this form of agriculture. The progressive action of the refugees stimulated the activities of the inhabitants of the Island. Every family possesses on an average 10 stremmas (one stremma is approximately $\frac{2}{3}$ of a donum) of land, and animal husbandry forms part of the activities of the landholders. The inhabitants are very industrious. They do not waste their time in cafés, and gambling is unknown in the rural areas. Vine cultivation is the most important activity, followed by that of olive, carob, almond, citrus and other fruit-bearing trees.

The following table shows the area of land under cultivation and the average annual production :—

<i>Kind</i>		<i>Area in stremmas</i>		<i>Number of Trees</i>		<i>Average annual yield (in okes).</i>
Wine	} Vines	154,000	..	—	..	29,500,000 wine
Sultana		75,500	..	—	..	15,000,000 sultanas
Tahtas		40,000	..	—	..	40,000,000 grapes
Table grapes		15,000	..	—	..	13,500,000 „
Olive trees	..	—	..	12,950,000	..	20,000,000 olive oil
Carob trees	..	—	..	2,795,000	..	27,100,000
Almond trees	..	—	..	1,353,000	..	1,991,000
Orange trees	..	—	..	555,000	..	3,530,000
Lemon trees	..	—	..	36,500	..	280,000
Citron trees	..	—	..	236,000	..	2,050,000
Mandarine trees	..	—	..	440,000	..	1,310,000
Miscellaneous fruit trees	..	—	..	1,477,736	..	—
Area cultivated with cereals and other kinds, per year	..	742,597	..	—	..	—
Total area cultivated		1,027,095				

Crete, like Cyprus, is rich in wild aromatic plants. These are gathered and exported as raw materials to the following extent :—

<i>Kind</i>		<i>Exports (in okes)</i>		<i>Price realized</i>
Laurel	.. ..	200,000	..	8-9 drachmas per oke (2½-3p.)
Sage	.. ..	400,000	..	8-9 „ „
<i>Origanum Dictamnus</i>	..	7,000	..	400-600 drachmas per oke (15-25s.)
<i>Origanum Hiracleoticum</i>	..	70,000	..	8-9 drachmas per oke (2½-3p.)

AGRICULTURAL CO-OPERATIVE SOCIETIES.

There are a great number of Co-operative Associations in every branch of agriculture. The aim of the Associations is to improve the quality of their products.

The Union of Citron Growers.—The Citron (*Citrus medica*) is one of the main products of the Island. The average annual production is 2,500 tons. Citrons undergo special treatment and are exported to Northern Europe. Some years ago the trade was carried out by individual merchants but the preparation of the product for export was so badly carried out that prices gradually fell until the trade became uneconomic. Legislation was introduced for the formation of the Citron Growers Union, this saved the industry and by proper preparation of the fruit for the market prices have increased and this product is now considered the most profitable in Crete. Prices between 3½p. to 4p. per oke are realized by the growers.

The following table gives the quantities of citrons delivered by the growers at the centres of delivery and the quantities exported for five seasons 1931 to 1936 :—

Year	Quantity delivered			Quantity exported		
	Okes			Kilos		
1931-1932	..	..	1,856,840	..	..	Nil
1932-1933	..	..	1,240,152	..	..	1,961,215
1933-1934	..	..	1,359,621	..	..	2,780,315
1934-1935	..	..	2,124,459	..	..	2,138,380
1935-1936	..	..	2,302,674	..	..	2,728,260

The most important markets for this product are the United Kingdom, Germany, United States of America, Canada, Belgium, Holland and Sweden.

Wine Co-operative Societies.—There are seven such Societies with a membership of over 5,000. The Societies possess up-to-date installations, for the manufacture of wine, which produce over 4,500,000 okes of wines of various types. The Societies function under the management of a Committee and they employ the services of a wine chemist. All the Societies are under the general control and supervision of a supreme authority. Shares in the Societies are valued at 500 drachmas. The owner of 5 to 10 stremmas of vineyards is entitled to purchase 2 shares and the owner of 10 to 15 stremmas is entitled to hold three shares and so on, up to a limit of 100 shares.

Olive-Oil Co-operative Societies.—There are eight co-operative olive-oil Societies in the District of Candia alone. The slow and defective primitive methods of making olive-oil in the villages are being replaced by the more efficient methods of the Co-operative Societies and the state of the olive-oil industry is gradually improving.

There are also co-operative dairies and raisin growers Societies.

SULTANAS.

The sultana vine is being cultivated extensively in Crete, particularly in the District of Candia. Some 65,000 stremmas are under cultivation in this district and the annual production ranges from 11 to 12,000,000 okes. Thirty-five years ago sultana cultivation was almost unknown. Many vineyards of other varieties have been converted to sultana by grafting, and prosperity is evident in all regions where sultana and table grapes are cultivated.

The development of the sultana industry in the District of Candia is seen from the following table :—

<i>Year</i>	<i>Production</i>				<i>Average production</i>
—	<i>(in okes)</i>				<i>per stremma (okes)</i>
1920	..	..	2,500,000	..	250-300 sultanas
1925	..	..	4,500,000	..	—
1930	..	..	6,500,000	..	—
1937	..	..	12,000,000	..	—

The town of Candia is the commercial centre of the sultana industry. Some 14 special factories worth over half a million pounds are established there.

The exports of sultanas from the port of Candia from 1933 to 1937 are as follows :—

<i>Year</i>	<i>Total Exports</i>				<i>Quantity exported to</i>
—	<i>(in kilos)</i>				<i>England (in kilos)</i>
1933	..	..	13,650,510	..	3,349,452
1934	..	..	13,800,600	..	3,305,497
1935	..	..	19,258,665	..	5,585,057
1936	..	..	14,290,953	..	3,127,271
1937	..	..	13,406,402	..	3,658,873

Cultivation Methods.—The sultana is cultivated with best results in deep slightly inclining sandy clayish soils containing a high percentage of lime. The subsoil should be capable of preserving coolness. The soil is dug to a depth of 50 to 60 cms. if possible during the summer months. This process of deep digging before planting is of the greatest importance because on this depends in a large measure the whole future of the vineyard. Selected cuttings or rooted cuttings are planted. The cuttings are planted to a depth of 50 cms., 1.50 to 1.80 meters apart in the rows with 2 meters between rows. Holes are opened for planting. The planting season begins in November and finishes at the end of spring according to the nature of the soil. Early planting takes place in crisp soils and late planting in wet soils.

The cost per stremma planted is :—

						<i>Drachmas</i>
Digging	..	..	..	..	..	2,200
Ploughing and levelling	..	..	..	..	..	200
Planting	..	..	..	..	..	600
Total	..	..	..	..	..	3,000

Production begins in the third year when expenses have reached the figure of 5,000 drachmas (546 drachmas=£1).

In detail the cultivation proceeds as follows :—

- (a) From the early stages of the plants' life basins are made to serve to retain rain water and to cut away superficial roots to the advantage of the deep roots. The basins are made annually and are prepared in October and November.
- (b) Winter digging is always done by hand in January and February after the pruning.
- (c) One or two diggings are carried out during the spring to ensure good appearance, evenness and absence of weeds during the summer.
- (d) Intensive fertilization with chemical fertilizers and animal manure, when this is available, is practised. Fertilizers are applied before the winter digging when the basins are still open. The quantity of chemical fertilizer usually applied is 60 to 120 drams for every plant for the type 6-8-8 or 4-10-5. When only nitrogen is used 20 okes are applied to one stremma. Animal manure is used at the rate of 750 okes per stremma combined with 20 to 30 okes superphosphate and 12 okes potash.
- (e) Pruning begins at the end of December and continues throughout January. The vines are bush form with branches shooting forward at a height of 20 to 25 cmt. Cane pruning is practised. Between 8 to 12 sticks are left, every stick containing 3 to 5 buds.
- (f) Green pruning is invariably effected on sultana vines when the sprout reaches a length of 20 to 25 centimetres. A second or third green pruning is given according to the condition of the vine. Green pruning is important, not so much for its bearing on a second production in the same year, but for the conversion of the shoots into fruit-bearing branches in the next year.
- (g) Shoot cutting is done simultaneously with green pruning when there are superfluous shoots.

The most serious diseases are oidium, downy mildew, apoplexy and eudemis.

The cost of cultivating a stremma of sultana vines is :—

	<i>Days</i>		<i>Drachmas</i>	
Making basins	2	..	100	
Pruning	1½	..	100	
Winter digging	6	..	400	
Fertilizers	..	..	300	
Digging	..	..	200	
Green pruning	..	..	100	
Disease control	..	..	250	
Stakes	..	..	100	
Vintage and drying	..	..	450	
Total	..	..	2,000	

The sultana vine, when properly cared for and cultivated on suitable soil, will yield approximately 500 okes of sultanas, under very favourable conditions a yield of 1,000 okes may be obtained. The average production is 300 okes. Between $3\frac{1}{2}$ to $4\frac{1}{2}$ okes of fresh grapes produce one oke of sultanas. Sultanas cost 4 to 7 drachmas to produce and the price realized by the grower varies from 14 to 23 drachmas per oke.

PREPARATION OF SULTANAS.

Drying.—Vintage commences in the middle of August. The sultana grapes are dipped in a solution of carbonate of potash 6° to 10° Baumé. The best solution is 6° to 7° Baumé, but this is determined according to climatic conditions and size of grapes. If the weather is cold and damp or the grapes are large, the solution is increased or decreased accordingly. The grapes are dipped for 30 seconds. With this dipping the grapes lose the surface dusty layer and assume a lustrous appearance. Before dipping, olive-oil of good quality is placed in the solution in the proportion of 70 drams per 100 okes. After dipping 8 to 10 baskets, each containing 8 to 10 okes of grapes, a further 12 drams of olive-oil are added. In some cases the practice of adding only one oke of olive-oil at the outset is followed. The proportion of olive-oil is determined by experience. Too much olive-oil darkens the sultanas which unfavourably affects the market prospects. The following should be taken as a general guide on the use of olive-oil :—

- (a) A thick solution requires much olive-oil.
- (b) A thin solution requires little olive-oil.
- (c) When the olive-oil contains a large proportion of acids, it is added in small quantities.
- (d) When the grapes become lustrous in 15 seconds this is an indication that an excess of olive-oil has been used.
- (e) When the grapes do not become lustrous in 30 seconds too little olive-oil has been added.

Injured grapes should be removed before dipping. After dipping the grapes are spread out in a specially-prepared place. The grapes are spread on white paper and precautions are taken to provide a suitable cover at night-time or during rains.

A light sprinkling of the solution is given on the second or third day to accelerate drying, this is repeated if necessary. Under favourable conditions the drying process is completed on the sixth day. The sultanas are gathered, preferably during the evening, sifted and packed in sacks ready for sale to the factories which prepare the product for export.

The spreading ground is a level piece of ground with a slight incline. It is divided into parallels separated by small ditches which drain away the rain water. Each section is 4 meters wide and 12 to 20 meters long. Around each section posts are erected to hold up the cover used at night. Each section costs approximately 5,000 drachmas and is sufficient space for 250 okes of sultanas at one time. Growers who do not use specially-made drying grounds produce low grade sultanas.

Preparation for Export.—The grower delivers his sultanas packed in sacks at packing houses specially equipped for preparing raisins for export. The sultanas first undergo a washing process. They are then placed on special trays which are piled up on wheeled wagons up to 32 in number. While the sultanas are still wet the wagons of sultanas are conveyed to the sulphuring chamber for bleaching purposes. Sultanas destined for the United Kingdom market should not contain sulphur over the limit allowed by the United Kingdom authorities. After bleaching the sultanas are transferred to the dehydrators in which a temperature of 60° to 70° C. is maintained. After removal from the dehydrators the sultanas are cooled outdoors or on special cooling chambers. Before packing for export, the sultanas are oiled, all deep coloured raisins are removed, stems are removed by passing through a special apparatus and a sifting device sorts the sultanas according to size.

The sultanas are packed in special boxes according to grade. Each box weighs 15 kilos with a net weight of 13½ kilos and the box is marked for export with the trade mark of the factory, name of firm, place of packing and net weight.

The cost of preparation for export is from 6 to 9 drachmas per oke.

Prices realized in the United Kingdom market in 1937 were :—

Type	No.		53s.	per 50 kilos	..	c.i.f. London
	0	..	53s.		..	
	1	..	50s.	..	..	..
	2	..	46s.	..	..	..
	3	..	42s.	..	..	..
	4	..	40s.	..	..	..
	5	..	37s.	4½p.	..	..
	7	..	35s.	..	..	..
	12	..	40s.	..	..	..
	14	..	36s.	..	..	..

Exports in August fetch 2s. more.

Exports from 11th to 15th September, 1s. more.

Exports in October fetch 1s. less.

PRODUCTION AND MARKETING OF FRESH GRAPES IN CRETE.

Climatic and soil conditions are suitable for the production of table grapes. The methods of cultivation are similar to those followed in the cultivation of sultanas, except at the village of Archanas for the production of the "Rozaki" variety. At Archanas each vine rests on a wooden or cement post 2.45 meters in length. Each row of posts is linked together by iron bars. The bars are covered with reeds thus forming a large shelter with the branches of the vine on the roof. In June and July care is taken to allow the grape bundles to hang downwards and receive the shade of the roof. The height of this device allows free movement of persons underneath. Vineyards cultivated in this way yield between 1,500 to 2,000 okes of grapes annually per stremma.

The cost of installation is :—

Drachmas

Cement-made posts : 320 pieces @ 25 drachmas each..	8,000
Transport and erection expenses of posts	320
Iron-bars (500 oke)	5,500
Reeds (1,000 pieces)	1,000
Total	14,820

The "Rozaki" is the best table grape grown in Crete. The berries are large, juicy and sweet in flavour. They stand handling in packing and can endure transportation to distant markets.

The "Rozaki" is considered the best of its kind and growers are paid higher prices.

Until 1928 the exportation of table grapes was confined to the Egyptian market, since 1929 they have been exported to Europe. Special measures have been taken to assist the trade and special arrangements are made for overland transport by rail from Greece.

Picking of grapes is carried out by groups of workers employed by merchants. Bunches of grapes at the correct stage of ripeness for packing are gathered, injured grapes are removed and the bundles are placed in special wooden boxes for transportation. The size of the boxes is 2' x 1' x 8". Special scissors are used for cutting the bunches and care is taken by the workers not to touch the bunches with their hands and thereby destroy the bloom on the surface of the grape berries. The boxes are conveyed with great care in motor lorries to the packing houses and special care is exercised at the time of loading and unloading.

Packing is done by skilled female labourers, a skilled labourer can pack from 70 to 100 boxes per day.

Shipments to the English markets are made in refrigerated steamers, the voyage lasts about 9 days.

The transport expenses to the packing house, packing and other expenses until the grapes are ready for shipment amount to 6 drachmas per oke.



The Milk Yield of Maltese and Native Goats.

By J. P. MAULE, M.A., *Manager, Government Stock Farm.*

AN EXPERIMENT was carried out at the Government Stock Farm this year to compare the yields of Maltese and native goats under the conditions of extensive grazing which obtain at Athalassa.

Maltese goats were imported in 1930 and since then have not been specially treated, but have grazed daily in the plantation with the sheep flock. Some extra food has however been given upon occasions during milking but this has been limited both in daily and total quantities. The average yield of the Maltese goats has hardly varied at all during the last three years, the average for the years 1935-1937 being 164 okes (=207 kg. or 455 lbs.) or 328 drams (=1,044 grams or 2.27 lbs.) per day. The lactation period has averaged 200 days, exclusive of the period during which the kids were suckled (approximately two months). The average yield of the local "nomadic" goat in Cyprus is considered to vary, according to the district and method of management, from 35 to 120 okes for a period of 120 to 180 days. It was therefore directly to compare the yields of the two breeds under the same conditions that the present experiment was undertaken, the two groups being grazed together with the sheep without receiving any concentrates. An additional group of Maltese goats was selected and fed a ration of concentrates consisting of oats, barley and bran throughout their lactation including the suckling period, when they were grazed separately on lucerne or other good pasture.

The three groups of goats were as follows:—

Group I.—10 Maltese goats, including 7 that had not previously kidded; they all kidded between 18th January and 20th February, 1938.

Group II.—10 native goats, bought at Sinda in April, 1937; at least 5 of them had not previously kidded and all kidded between 4th and 21st February, 1938.

Group III.—6 Maltese goats, average age 5½ years; kidded between 3rd and 9th November, 1937; fed approximately ½ kg. or 150 drams per day, concentrates.

Milking began on 18th March for Group I, 6th April for Group II and 1st January for Group III, after an approximate suckling period of eight weeks. One goat in Group I lost her kid when two days old and was milked for an appreciably longer period as a result of this. The milk yields of Groups I and II are given in two ways: Table I gives the yields for an equal period (of 169 days), this being the minimum milking period of any goat in either group, and Table II gives the total lactation yields. The average yields in each case are also given. Since the goats in Group III milked for a much longer period their yields are only given in Table II. Yields are given in kg. and okes as the former are used by most research workers and in all Near Eastern countries except Cyprus where the oke is the common measure.

In comparing these figures with the average yield for the three years 1935-1937, it can be seen that the average yield of Group I was 25% lower and of Group III 73% higher than this, which is roughly what might be expected. The butter fat tests were carried out at fortnightly intervals from May to September, the average for the two groups being given in Table I. It will be seen that the native goats gave appreciably richer milk than the Maltese goats.

TABLE I.—AVERAGE MILK YIELDS OF GOATS FOR 169 DAYS, IN KG. AND OKES.

Group	Av. yield of milk	Av. B.F. %	Av. daily yield	Maximum yield	Minimum yield
Yields in kg. :					
I Maltese	152.3	4.0	0.901	192.8	96.9
II Native	119.7	5.0	0.703	169.3	75.9
Yields in okes :					
I Maltese	119	4.0	281 dr.	150	76
II Native	94	5.0	219	132	59

TABLE II.—AVERAGE LACTATION YIELDS OF ALL GROUPS.

Group	Av. No. of days suckled	Av. No. of days milked	Av. Lactation yield	Av. daily yield	Maximum yield.	Minimum yield
Yields in kg. :						
I	52	185	157.0	0.848	213.9	103.4
II	59	171	120.0	0.702	169.3	75.9
III	55	273	357.6	1.310	459.4	287.1
Yields in okes :				<i>drams</i>		
I	52	185	123	265	167	80
II	59	171	94	219	132	59
III	55	273	279	409	360	224

Notes.—1 oke = 1.28 kg. = 2.8 lbs.

1 kg. = 2.2 lbs. = 0.78 oke.

These results appear to indicate two things, namely:—

(1) that the Maltese goat under "nomadic" conditions is not vastly superior to the local goat, and

(2) that under the best conditions of management the Maltese goats will give much higher yields than under conditions similar to those under which the "nomadic" goat is kept.

These conclusions however must be modified in so far as they apply only to conditions at Athalassa—conditions which would probably be considered superior to the normal grazing available to the majority of goat flocks in Cyprus. There is the further question of the cost involved in hand-feeding the goats to obtain their maximum yield but it seems evident that this type of goat, if well fed, will give approximately three times as much milk as the ordinary goat in Cyprus. This being so there appear to be some grounds for encouraging the keeping of hand-fed (or household) goats at the expense of the "nomadic" goat. This experiment has only indicated what the pure Maltese breed can do in comparison with local goats but there are known to be a large number of so-called crossbred goats in the Island which are hand-fed and give high yields of milk. Further investigations with this type are desirable as well as an experiment to see what the "nomadic" goat would give under conditions at Athalassa if also fed extra food for milk productions.

Sheep and Goat Management.

BY L. G. FRANGOS, *Stock Inspector, Limassol.*

WE ALL know that stock breeding is one of the main sources of prosperity in our Island. But it is also well known that very few owners pay attention to the good management of their animals, especially of their sheep and goats.

In this article, I shall try to explain the care which sheep and goats need for their well being and for the production of milk, wool and meat in quantities sufficient to repay the trouble and expense incurred by the owners for their management.

PENS (Mandres).—The first thing to which an owner must pay attention is the preparation of a good mandra, to protect the sheep or goats from cold and rain.

Mandres, as a rule, should face southwards, so as to be under the influence of sunshine for the greater part of the day. In establishing a pen, care must be taken with regard to its height; this must be such as to allow sufficient ventilation of the mandra; not, as usually is the case in villages, where the ceiling is so low that the animals are unable to stand.

Good ventilation and plenty of sunshine help to keep the inside of the mandras always dry; dampness is very bad for the health of animals.

The floors of mandras must always be dry (preferably made of *havara*). If the soil is of clay, a layer of sand must be spread on it to absorb the dampness; where this is done, the manure need not be removed every day. When, however, it is removed, the layer of sand must be removed also, and replaced by a new and dry one.

Levelling the floor is essential for the rest of the animals; a slight slope is also necessary for proper drainage.

Attention must be paid to the width of the entrance of the mandra; this must be such as to prevent overcrowding, to avoid accidents, especially among pregnant animals. Every pen must be supplied with an adequate number of mangers, for the proper distribution of additional food during nights and very rainy days, as mentioned below. The usual wooden mangers of trench shape are satisfactory for the purpose.

FEEDING.—Feeding is one of the most important factors for the improvement of a flock. This, I am sorry to say, has received attention from but a small number of flock-owners in certain villages. Most flock-owners consider that sheep and goats should only be fed by grazing in fields and forests, and they do not trouble to give their animals the necessary additional food, especially during the autumn and winter months. The result of this is that many animals die of hunger in those years when green grass is not obtainable early; it is also in those years that *parasitic gastroenteritis* makes its appearance in the most severe form, and causes heavy losses to sheep and goats; the animals, becoming weak from the presence of the many internal parasites, and not finding sufficient food to recover the strength which they lose, die of debility; only a few young and strong animals are able to survive, but are so weakened that, even if the females do not abort, their offspring are very weak and will be liable to die from the slightest cause. The yield of milk from the mothers under such circumstances will be negligible.

Such heavy infection with *parasitic gastroenteritis* and lack of food occurred in 1936, and many, no doubt, remember the heavy losses which sheep and goats suffered during that year.

To avoid such losses in future and to obtain healthy animals which yield a profit, all owners of such animals must give them additional food, especially during the autumn months, when the stubble remaining after harvest is lessened or destroyed due to the continuous grazing and the rains, and green grass has not grown sufficiently to provide nourishing food for the animals. There are several feeding stuffs in this country which can be used profitably for the purpose. Such are cereal straw, vetch straw (*rovashero*), barley and carobs. Hay made from such fodder plants as barley, oats, vicos and lucerne makes very good food for animals.

Green food is very desirable for sheep and goats ; it can be procured during the summer and autumn months, in places where sufficient water is available for irrigation. There are many crops suitable for the purpose, but the best known in Cyprus are lucerne and maize.

Green food may also be obtained from certain drought-resisting plants, such as *Atriplex semibaccata* (creeping salt-bush) which, having been introduced into Cyprus in 1899 and planted in Saint Lazaros and Bambula marshes at Larnaca, has continued to grow ever since and is propagated without any cultivation or care. Another drought-resisting fodder plant is *Atriplex halimus* (Ramos), used in Larnaca for hedging. Both these plants are doing quite well on salty lands where few other plants can grow.

Experiments on drought-resisting plants are being carried out by the Agricultural Department, and the best of them will be distributed in due course.

GRAZING.—I have said above that green food (grass) is one of the best feeding stuffs which we can give to our animals ; but very often, during winter and spring months such food causes death if given to sheep or goats when wet due to rain or dew. Wet grass may cause *tympanitis*, a disease which in many cases ends fatally. Frequently also, such food gives rise to *parasitic gastroenteritis* (tillara), in the following way : the worms which cause this disease ascend to the top of the wet plants during the cool nights but when the dew is evaporated by the warmth of the sun, they descend to near the roots of the plants in search of the moisture which is essential for their existence. Thus, if the animals are taken out for grazing very early in the morning, as is usually done and eat wet grass, they run the risk of contracting *tympanitis*, or of becoming affected by *parasitic gastroenteritis* through swallowing large numbers of worms. If, however, they are taken out for grazing after the evaporation of the dew, none of these is to be feared. A good practice is to give the animals some dry food, in the morning, before they are taken out for grazing.

SELECTION.—For the purpose of improving a flock, the necessary male animals are first selected ; these should be of a good breed, the features of which it is desired to transmit to the animals of the flock ;

they must be suitable for reproduction and must not be relatives of the females which they will serve ; in-breeding should generally be avoided, because by this the offspring may become constitutionally weakened and thus easily affected by many diseases.

In selecting the young females in the flock, we should keep those which are most lively and show best the required features of the breed ; the others should be sold soon after they are fit for slaughter. Selection must be done every year. In doing so, we must not only try to select the best of the young animals, but also to rid the flock of those which, as a result of heredity or old age, are not able to provide a profit, justifying their upkeep. Sheep or goats over 7 or 8 years old should never be kept in the flock, unless particularly valuable.

CARE AFTER BIRTH.—After parturition, the mothers must be left in the mandra together with their young ones for a few days, *i.e.* till the newly-born animals are able to follow their mothers to the pasture. The practice in most parts of the Island, in which the mothers are taken out for grazing, and the young ones are kept locked in the mandras where they remain without food all day, is a very bad one. On account of this, the young animals, not only do not grow well, but in many instances suffer from stomach derangements due to the large quantity of milk which they obtain as soon as they see their mothers again, after many hours' hunger.

We must always bear in mind that the good growth of animals depends largely on their good nourishment during the first part of their life.

DISEASES.—The diseases mentioned here, as well as the others which affect sheep and goats in Cyprus, are dealt with in *Leaflet No. 15* (Educational Series) of the Agricultural Department.

1. *Anthrax* (Flangara) is prevented by inoculations carried out every year by the Veterinary Service. Villagers must do their best to assist the efforts of the Government for the eradication of this disease, by proper disposal of carcasses of animals which die within a short time after they are noticed to be sick, or those which die suddenly not having shown any symptoms beforehand. Proper disposal means deep burial of carcasses or burning them, when possible, without opening or skinning them.

2. *Parasitic Gastroenteritis.*—This disease can be prevented by combating the parasites which cause it. Regular dosing with copper sulphate solution (two ounces of copper sulphate in 2½ oke of water), once every month has proved very effective for this purpose ; the dose for each animal is 1 to 2 ounces, according to age. Extra nourishing feeding, as described above, in addition to dosing, helps very much in the prevention of the disease.

3. *External Parasites* (Lice, Ticks, etc.).—These can be combated successfully by regular dipping of sheep and goats, using a solution of certain arsenical preparations ; the chemical required is issued free by the Veterinary Service, from which plans of the necessary dipping tank may also be obtained. The dipping must be done every 3 or 4 weeks ; in this way the parasites are destroyed and in the case of sheep a rich production of wool both in quantity and quality is obtained.

There are many dipping tanks in various parts of the Island but their number ought to be increased, so as to have at least one to each group of three or four villages.

4. *Oestrus Ovis* (Louros or Louvernas).—All villagers know what great trouble this fly causes to sheep and goats, and even to men, during the spring and summer months. The sheep from fear of the fly do not graze during the greater part of the day; they do not rest nor chew their food. The result of this is that the animals become weak, although ample food is available for them during both the above-mentioned seasons.

The attack of the fly can be prevented by dressing the nose just above the nostrils of each animal with a mixture containing equal parts of tar and waste engine oil. This mixture has the quality of keeping the fly away from the animals, which are thus free to graze or rest, as they will all day long.

The dressing of the nose as above must be done twice a day during March and once a day from April to the end of summer.

5. *Navel Ill* (Neroghaliasma).—This disease is very common in Cyprus; it can be prevented if the navel of each newly-born animal is tied with a strong thread and then cut and disinfected with iodine.

CONCLUSION.

From what has been written above, it will be seen that the attention which a flock-owner must give to his flock may be summed up as follows:—

1. Preparation of a good mandra.
2. Hand-feeding of sheep and goats when good pastures are not available.
3. Not taking flocks out for grazing in winter and spring till after the evaporation of the dew.
4. Selection of the best animals every year.
5. Leaving young animals with their mothers so that they may feed as often as necessary.
6. Deep burial or burning of carcasses of animals suspected to have died of Anthrax.
7. Dosing with copper sulphate, once every month.
8. Dipping once every month.
9. Daily application of dressing for avoiding the sheep nostril fly, from March to end of summer.
10. Antiseptic dressing of the navels of newly-born animals.

These are ten very simple things which can be done by anyone, and must constitute the decalogue of every flock-owner, who desires his own prosperity as well as that of his co-villagers, and of this Island as a whole.

Sericultural Notes.

DEMONSTRATION SILKWORM REARINGS IN GIRLS' SCHOOLS DURING THE YEAR 1938.

DEMONSTRATION silkworm rearings were carried out during the school year 1937-38 in 125 girls' schools (115 Orthodox-Christian and 10 Moslem), of which 18 failed for various reasons, chiefly due to difficulties at the time of hatching owing to the unusually cold weather at that time, or were not considered satisfactory. Approximately 2,130 school girls and boys attended the rearings and were taught the improved methods of hatching the eggs and rearing the silkworms.

The maximum quantity of cocoons produced was at the rate of 84 okes per ounce of eggs, and the average for the 107 successful rearings was at the rate of 57 okes 352 drams per ounce of eggs, compared with 78 okes 96 drams and 47 okes 100 drams respectively last year.

As already announced, the Agricultural College Old Students' Club Cup for the best demonstration silkworm rearing in a girls' school has been awarded for 1938 to the girls' school of Ayios Amvrosios (Kyrenia District), schoolmistress Miss Korallia Economidhou, which obtained the highest production of cocoons (84 okes of cocoons per ounce of eggs), and which also won this cup for 1937.

Prizes for 1938 were as usual given by the Agricultural Department in co-operation with the Education Department to schoolmistresses who carried out satisfactory demonstration rearings, these prizes being awarded as follows:—

DISTRICT PRIZES.

Nicosia District.

Lakatamia—Ev. Konstantinou, Ev. Christou	..	..	} 13s. 3p. for each school.
Morphou—Theodora Ioannou	..	..	
Lefka (Moslem)—Zehra Nerber, Hav. Houssein	..	..	
Naz. Dervish	..	..	

Larnaca District.

Mazotos—Ath. Nikolaou	..	..	..	..	£1
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Famagusta District.

Galatia (Moslem)—Hava Zishan	..	..	..	..	£1
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Limassol District.

Episkopi—Ioulia Voreadhou	..	..	..	..	£1
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Paphos District.

Amarketi—Elli Ioannou	..	..	..	..	£1
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Kyrenia District.

Ayios Amvrosios—Korallia Economidhou	..	..	..	£1
--------------------------------------	----	----	----	----

Prizes of 10s. each have been awarded to 99 schools.

HIBERNATION OF SILKWORM EGGS.

Arrangements have been made by the Agricultural Department for the hibernation of locally-produced and imported silkworm eggs at the same house at Pedhoulas which has been used for this purpose in previous seasons. All silkworm eggs are required to remain at the hibernation station from 5th January to 20th February.

ISSUE OF MULBERRY PLANTS FREE OF CHARGE.

The Agricultural Department has again arranged for the issue of mulberry plants this season from the Nursery and School Gardens, free of charge, to farmers requiring them.

Farmers desirous of taking advantage of this offer should apply to the nearest Agricultural Station.

A total of 9,220 young mulberry plants were issued free of charge last season to farmers from Nursery and School Gardens.

COMPARATIVE STATEMENT SHOWING THE QUANTITY OF SILKWORM EGGS HATCHED OUT AND REARED DURING THE YEARS 1934-1938 (IN OUNCES).

<i>District</i>	1934	1935	1936	1937	1938
Nicosia ..	710	858	820	854	1,100
Larnaca ..	271	249	230	230	284
Limassol ..	179	138	170	214	206
Famagusta ..	1,130	985	1,023	1,075	1,080
Paphos ..	1,269	800	750	816	1,000
Kyrenia ..	1,026	940	1,098	1,107	1,096
Total ..	4,585	3,970	4,091	4,296	4,766

The following table shows the quantity of silk cocoons and silk produced in 1938 :—

District	Cocoons purchased by merchants, okes	Cocoons used for egg production, okes	Cocoons spun into thread, okes	Cocoons reeled, okes	Silk produced, okes	Total quantity of production, okes
Nicosia ..	1,150	828	1,060	18,402	2,270	21,440
Larnaca ..	363	—	900	6,937	860	8,200
Limassol ..	295	—	63	5,472	700	5,830
Famagusta ..	572	145	1,000	22,683	2,615	24,400
Paphos ..	12,930	120	2,950	9,000	1,190	25,000
Kyrenia ..	10,810	—	800	21,700	2,534	33,310
Total ..	26,120	1,083	6,773	84,194	10,169	118,180



Early Fruiting of Olive Trees.

BY C. MILTIADES, *Agricultural Assistant, Larnaca.*

MOST of the demand for olive trees in Cyprus is satisfied by the uprooting of wild olive trees from the state forests. Wild trees are also found, either in clumps or individually, scattered about the country, due to the dispersal of the seed through the agency of birds and animals.

The general practice is for farmers to uproot olive trees and plant them immediately in small holes, recently dug for the purpose. An inadequate watering is then given, followed by another in the winter and two or three in the summer.

The majority of growers do not graft the trees in the 1st year after planting, but wait until the shoots have attained a diameter of 8-10 m.m. which may be 4-5 years after planting owing to the poor treatment given to the trees.

Owing to the fact that trees are often badly chosen and carelessly uprooted, a large number do not commence growth for over a year, which means a delay in grafting, and consequently fruiting, which may not occur until the 8th or 9th year.

The following paragraphs indicate the manner in which trees can be encouraged to fruit earlier :—

1. Before uprooting, healthy and well-shaped trees should be chosen. Uprooting should be done during winter and care should be taken that a quantity of undamaged roots is uprooted with the trunk.

2. The trees should be placed closely in an inclined position in a trench with the lower half of each buried. They should be left like this until January or February of the next planting season. They should be regularly irrigated throughout the summer months while they are still in the trench. Any trees showing signs of life should be budded on the succulent part of the stem about May or June, about 4' above the root. Some trees may not show signs of life, although remaining green, and those may be discarded if there are no swellings on the stem to indicate that new shoots will burst out.

3. Holes, 3' x 3', should be opened in October of the planting season to receive the trees and a dressing of animal manure should be mixed with the soil. The newly-planted trees should be staked and watered.

4. In summer, waterings should be given at least twice a month and the ground round the trees hoed at least once a month.

If these simple instructions are followed, it is possible to have fruit in the 3rd or 4th year.

Some Publications of the Imperial Economic Committee.

I.—SURVEYS OF WORLD PRODUCTION AND TRADE.

	<i>s.</i>	<i>d.</i>
Cattle and beef	5	6
Ground nut products	4	6
Mutton and lamb	4	5
World consumption of wool, 1928–1935	4	6
Apples and pears	4	6

II.—COMMODITY SERIES.

The publications in this series, which are revised annually so as to keep them up to date, give in summary form the chief statistical data of Empire and World production and trade for the commodities concerned.

	<i>s.</i>	<i>d.</i>
Meat	2	8
Fruit	2	8
Grain crops	2	8
Industrial fibres	2	9
Plantation crops	2	9
Dairy produce	2	8
Vegetable oils and oilseeds	2	9

III.—INTELLIGENCE SERVICES.

(1) *Periodicals.*

	<i>Annual Subscription Post free</i>
Dairy Produce Notes (<i>Weekly</i>)*	£2
Fruit Intelligence Notes (<i>Weekly</i>)*	£2
Canned and Dried Fruit Notes (<i>Monthly</i>)	£1
Weekly Arrivals of Canned Fruits, Fruit Pulp, Tomato Products and Dried Fruits (<i>Weekly</i>)	inclusive
Wool Intelligence Notes (<i>Monthly</i>)	£1

Specimen copies of "Tobacco Intelligence," a new quarterly service of the Committee, may be obtained from the Secretary.

Intending subscribers should apply to the Secretary, Imperial Economic Committee, 2, Queen Anne's Gate Buildings, Dartmouth Street, S.W.1.

(2) *Annual Reviews.*

These are free to subscribers to the respective Intelligence Services. Non-subscribers can obtain copies from the addresses given below, at the prices listed.

	<i>s.</i>	<i>d.</i>
Fruit supplies	2	10
Dairy produce supplies	2	11
Canned and dried fruit supplies	2	9
Wool production and trade	2	9
World consumption of wool, 1937	2	11

The Surveys, Commodity Series, and Annual Reviews can be obtained from H.M. Stationery Office, Adastral House, Kingsway, London, W.C.2 (and branches), or direct from the Secretary, Imperial Economic Committee, 2, Queen Anne's Gate Buildings, London, S.W.1, or through any bookseller.

[All prices shown include postage.]

FRUIT.

(1) *Intelligence Services.*

The publications under this head are compiled primarily for the benefit of producers and traders in Empire countries and give the fullest possible information regarding actual and prospective supplies.

	Annual Subscription
Fruit Intelligence Notes (<i>Weekly</i>)*	£2
Canned and Dried Fruit Notes (<i>Monthly</i>)	£1 inclusive
Weekly Arrivals of Canned Fruits, Fruit Pulp, Tomato Products and Dried Fruits (<i>Weekly</i>)	

Annual summaries, reviewing for the year the trade of the United Kingdom and other importing and exporting countries, are issued as supplements free to subscribers to the respective Intelligence Services. Non-subscribers can obtain copies at the prices listed. s. d.

Fruit Supplies	2	10
Canned and Dried Fruit Supplies	2	11

(2) *Commodity Series.*

The publications in this series, which are revised annually, give in summary form the chief statistical data of Empire and world production and trade for groups of closely related commodities. s. d.

<i>Fruit</i> : covering apples, pears, bananas, citrus fruits, grapes, wine, raisins, and currants and canned fruit ..	2	8
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TOBACCO.

Tobacco (1937)	2	2
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Specimen copies of "Tobacco Intelligence," a new quarterly service of the Committee, may be obtained on application. No charge is being made for this service at present.

[All prices shown include postage.]

Apply to:

THE SECRETARY, IMPERIAL ECONOMIC COMMITTEE,
2 Queen Anne's Gate Buildings,
London, S.W.1.

* Reduced rates are applicable to producers and producers' organizations within the Empire.

Pyrethrum.

PYRETHRUM was introduced into Cyprus in 1897 by the Agricultural Department and tried in various localities. It was found to grow fairly well in the hill villages and samples of the flowers were sent to England for examination as to quality in 1923, 1925 and 1927. The Imperial Institute reports on these samples showed them to be of fair quality and indicated that, if care was taken to pick the flowers at the correct stage of development, Cyprus pyrethrum would find a ready sale in England.

Pyrethrum is now grown to a very small extent in scattered gardens in the hill villages where the flowers are used locally for making a crude insecticide. Unfortunately it has been found that under field conditions the yields are poor and consequently there has been no initiative shown by farmers in taking up pyrethrum cultivation.

Attempts have recently been made to cultivate pyrethrum in the Mesaoria and results so far have been encouraging. In a renewed effort to make more headway with this crop, the Department of Agriculture has imported seed of a high yielding Kenya strain and trials are being carried out at different altitudes to see whether the improved strains will make pyrethrum cultivation more profitable.

CULTIVATION OF PYRETHRUM.

Seed is usually sown in a seed bed in the autumn or early spring and planted out in the field some time in March. The plants are planted at 1' intervals and given frequent waterings to begin with. During the first summer, irrigations at fortnightly intervals are necessary, but in the second and subsequent summers a watering every month is all that is necessary. Flowers are gathered when they have reached the stage in which the ray florets (petals) are fully expanded while only the outer two rows of disc florets (yellow centre) are open. Pyrethrum powder and insecticides are prepared from the dried flowers after grinding. Yields of 60 okes to 120 okes per donum of dried flowers have been obtained in Cyprus and the market reports show that the value of pyrethrum flowers in London varies between about £50 and £100 per ton or even more.

Meteorological Data, Cyprus.

SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS. SEPTEMBER, 1938.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	90.00	64.73	1.53	3	1.32	0.41	—
Athalassa	—	—	1.61	1	1.61	0.71	—
Morphou	87.41	63.51	—	—	—	0.18	—
Makhaeras	—	—	0.75	3	0.40	0.27	—
<i>Famagusta District :</i>							
Famagusta	92.33	67.40	0.40	3	0.30	0.26	—
Akhyritou	89.13	63.60	0.14	3	0.11	0.20	—
Rizokarpaso	—	—	0.69	4	0.50	0.35	—
Lefkomiko	—	—	0.16	1	0.16	0.48	—
<i>Larnaca District :</i>							
Larnaca	84.80	62.63	1.75	2	1.60	0.60	—
Lefkara	—	—	0.50	1	0.50	0.70	—
<i>Limassol District :</i>							
Limassol	87.37	64.10	—	—	—	0.03	—
Saittas	—	—	1.02	4	0.45	1.16	—
Trikoukkia	72.70	52.67	0.80	4	0.37	1.09	—
Alekhtora	—	—	0.35	2	0.30	0.49	—
<i>Paphos District :</i>							
Paphos	70.90	67.40	1.09	5	0.45	0.27	—
Polis	—	—	0.45	2	0.25	0.40	—
<i>Kyrenia District :</i>							
Kyrenia	85.18	68.25	0.05	3	0.32	0.37	—

Note.—Compiled from returns furnished by Public Works Department.

OCTOBER, 1938.

<i>Nicosia District :</i>							
Nicosia ...	82.97	56.71	1.43	1	1.43	0.57	—
Athalassa ...	—	—	0.83	2	0.81	0.63	—
Morphou ...	82.60	55.51	1.25	1	1.25	0.45	—
Makhæras ...	—	—	2.10	2	2.00	1.11	—
<i>Famagusta District :</i>							
Famagusta ...	83.96	54.03	1.30	1	1.30	1.38	—
Akhyritou ...	82.06	54.32	0.92	2	0.90	0.97	—
Rizokarpaso ...	—	—	0.35	2	0.30	0.94	—
Lefkoniko ...	—	—	0.50	1	0.50	0.36	—
<i>Larnaca District :</i>							
Larnaca ...	80.16	57.10	1.05	2	0.70	0.79	—
Lefkara ...	—	—	1.85	1	1.85	1.23	—
<i>Limassol District :</i>							
Limassol ...	82.19	58.48	2.45	5	1.75	0.98	—
Saittas ...	—	—	2.37	2	2.22	1.30	—
Trikoukkia ...	67.85	46.26	4.30	3	3.75	2.87	—
Alekhtora ...	—	—	2.49	3	2.18	0.85	—
<i>Paphos District :</i>							
Paphos ...	71.45	60.65	1.79	2	1.74	0.76	—
Polis... ..	—	—	1.55	3	1.35	1.10	—
<i>Kyrenia District :</i>							
Kyrenia ...	78.19	60.16	1.36	4	0.75	0.97	—

NOVEMBER, 1938.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	69.23	48.43	1.10	6	0.44	1.18	—
Athalassa	—	—	0.82	4	0.26	0.96	—
Morphou, C.E.F. ...	70.04	49.76	2.86	4	2.10	1.11	—
Makhæras	—	—	2.53	4	1.13	2.24	—
<i>Famagusta District :</i>							
Famagusta	72.73	48.36	2.30	7	1.25	1.76	—
Akhyritou	69.77	46.98	1.56	5	0.53	1.27	—
Rizokarpaso	—	—	9.64	8	3.90	3.17	—
Lefkoniko	—	—	1.70	3	1.20	1.41	—
<i>Larnaca District :</i>							
Larnaca	69.66	50.33	0.90	5	0.35	1.47	—
Lefkara	—	—	1.66	4	0.88	2.24	—
<i>Limassol District :</i>							
Limassol	72.43	52.23	0.37	3	0.20	1.74	—
Saittas	—	—	0.80	3	0.60	1.88	—
Trikoukkia	56.37	37.47	1.65	5	0.55	2.47	7th
Alekhtora	—	—	1.66	4	1.12	2.03	—
<i>Paphos District :</i>							
Paphos	63.83	54.90	0.95	5	0.50	1.69	—
Polis... ..	—	—	1.33	4	0.78	1.60	—
<i>Kyrenia District :</i>							
Kyrenia	69.25	54.21	1.35	7	0.50	2.61	—

Note.—Compiled from returns furnished by Public Works Department.

Agricultural Department Publications.

THE following bulletins and leaflets have been published in English, Greek or Turkish as indicated by the letters *E.*, *G.* or *T.* after each title.

BULLETINS.

Industrial Series :

No. 1.—“The Grape and Wine Industry of Cyprus.” By M. T. Dawe, O.B.E., F.L.S. *E.*

No. 2.—“The Tanning Industry.” By M. T. Dawe, O.B.E., F.L.S. *E.*

Horticultural Series :

No. 1.—“Some Observations on the Citrus Industry of Palestine, with reference to Application of Improved Methods to the Citrus Industry of Cyprus.” By B. J. Weston, M.A., M.Sc., F.R.H.S. *E.*

No. 2.—“Picking, Grading and Packing of Citrus Fruits. A Guide for Exporters.” By B. J. Weston, M.A., M.Sc. (Agr.) *E., G. & T.*

The above two series are now combined and the following have been published :—

No. 3.—“Report on Soil Erosion in Cyprus.” By A. Pitcairn. *E., G. & T.*

No. 4.—“Summary of Agricultural Legislation in Cyprus.” *E.*

Entomological Series :

No. 1.—“Investigations into the Locust Plague in Cyprus.” By Ch. G. Pelagias, I.A. (Gx.), F.A.I. (Gx.), (also *Corrigendum*). *E.*

No. 2.—“A Survey of Olive Pests.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.* (*T.* out of print).

No. 3.—“Insect Pests and Fungus Diseases of Cyprus and their Control.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.*

No. 4.—“Injurious Insects of Cyprus.” By H. M. Morris, M.Sc., F.R.E.S. *E.*

Mycological Series :

No. 1.—“The Control of Fungus Diseases.” By R. M. Nattrass, B.Sc., Ph.D., D.I.C. *E., G. & T.* (*G.* out of print.)

“A first List of Cyprus Fungi.” By R. M. Nattrass, B. Sc., Ph.D., D.I.C. *E.*

LEAFLETS.

No. 1.—“Petroleum Emulsion.” *G.* (Out of print.)

No. 2.—“Boll Worms of Cotton.” *G.*

No. 3.—“Collection, Sorting and Packing of Oranges.” *G.* (Out of print.)

No. 4.—“The Cultivation of the Orange Tree.” *G.*

No. 5.—“Carpocapsa” *G.* (Replaced by No. 22.)

- No. 6.—“General Rules for Silkworm Rearing.” *E. G. & T.*
(Reprinted, see also No. 8, Educational Series).
- No. 7.—“Cultivation of Almond Trees.” *G.* (Out of print.)
- No. 8.—“Soil Manuring.” *G.* (Out of print.)
- No. 9.—“Control Measures for Red Scale of Citrus.” *G.* (Out of print.)
- No. 10.—“Seed Beds.” *G.* (Out of print.)
- No. 11.—“The Collection of Sumach.” *G.*
- No. 12.—“The Almond Pest (*Eurytoma amygdali*, End.)” *E., G. & T.*
(Out of print.)
- No. 13.—“Outline of the Rat Destruction Campaign for 1930.”
E., G. & T. (Out of print.)
- No. 14.—“Potato Tuber Moth.” *E., G. & T.* (Out of print; replaced
By No. 17).
- No. 15.—“Warble Flies.” *E., G. & T.* (*E.* out of print.)
- No. 16.—“Downy Mildew of the Vine (*Plasmopara viticola*).” *E., G. & T.*
- No. 17.—“Potato Tuber Moth.” *E., G. & T.* (Replaces No. 14.)
- No. 18.—“The White Rot of Onions in Cyprus.” *E., G. & T.*
- No. 19.—“The Production of Silage.” *E., G. & T.* (Out of print;
see No. 7 Educational Series.)
- No. 20.—“Importation of Plants, Fruit, etc., into Cyprus.” *E.*
(Reprinted and brought up to date.)
- No. 21.—“*Ceratitis capitata*, Wied. Mediterranean Fruit Fly.”
E., G. & T.
- No. 22.—“Pests of the Apple Tree.” *E., G. & T.* (Replaces No. 5.)
- No. 23.—“Citrus Wastage.” *E., G. & T.*
- No. 24.—“Pests of Citrus Trees and Fruit.” *E., G. & T.*
- No. 25.—“The Ox-Warble Fly.” *E., G. & T.*

Educational Series :

- No. 1.—“Agricultural Resources of Cyprus.” *E., G. & T.*
- No. 2.—“Breeding, Feeding & Management of Cattle.” *E., G. & T.*
- No. 3.—“Agricultural Calendar.” *E., G. & T.*
- No. 4.—“Linseed (*Linum usitatissimum*).” *E., G. & T.*
- No. 5.—“Sesame (*Sesamum indicum*).” *E., G. & T.*
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- No. 7.—“Production of Silage.” *E., G. & T.*
- No. 8.—“Sericulture.” *E., G. & T.*
- No. 9.—“Citrus Fruit Growing in Cyprus.” *E., G. & T.*
- No. 10.—“The Breeding and Management of Sheep in Cyprus.”
E., G. & T.
- No. 11.—“Flax.” *E., G. & T.*
- No. 12.—“Diseases of Poultry.” *E., G. & T.*
- No. 13.—“Irrigation in Cyprus.” *E., G. & T.*
- No. 14.—“Cereal Crops.” *E., G. & T.*
- No. 15.—“Diseases of Sheep and Goats.” *E., G. & T.*
- No. 16.—“The Cultivation of the Carob Tree in Cyprus.” *E., G. & T.*
- No. 17.—“Table Grapes & Raisins.” *E.*
- No. 18.—“Diseases of Cattle with Special Reference to Cyprus.” *E.*

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All communications for publication should be addressed to the Editor, *Cyprus Agricultural Journal*, Department of Agriculture Nicosia.

Contributions are invited, written on one side of the paper only. It should be understood that unaccepted manuscripts can not be returned unless postage is prepaid.

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The "*Cyprus Agricultural Journal*" is published in March, June September and December.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

The Horse Breeding Law, 1930. **LIST OF STALLIONS LICENSED FOR 1938.**

NICOSIA DISTRICT.

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Akaki	..	Michael Th. Rafti	..	29
..	..	Moisis Michael Tohingi	..	203
Argaki	..	Polyvios Theophani	..	153
Astromeritis	..	Christoforos Evangeli	..	26
Kalokhorio	..	Yioryis Papaconstantinou	..	262
Lefka	..	Ahmet Dopran Salih	..	255
Lymbia	..	Andronikos Petri	..	32
Morphou	..	Vasilis T. Spanos	..	18
do.	..	Andreas Ahapittas	..	249
Pera	..	Yiannis G. Magou	..	194
Pera Khorio	..	Tofis Michael	..	294
Yeri	..	Yeoryos Petri	..	16
Yerolakkos	..	Toglis Haralambi	..	22

LARNACA DISTRICT.

Alaminos	..	Rifat Jumaa	..	260
do.	..	Salih Jumaa	..	64
Aradhippou	..	Costis Kyriakou	..	15
do.	..	Lefteris Towli	..	225
Athienou	..	Haris Antoni	..	66
do.	..	Costas N. Haji Vrashimi	..	96
do.	..	Vasilis M. Phiakou	..	159
do.	..	Nicolas Vassili Yiancou	..	276
do.	..	Costis Koumenis	..	293
Larnaca	..	Ipermachos Kyriakou Petroladhas	..	288
Voroklini	..	Panayis Theodosi	..	106

FAMAGUSTA DISTRICT.

Akanthou	..	Yiannis Hambi	..	270
Asha	..	Antonis Michael	..	92
do.	..	Christos Haji Lavithi	..	234
do.	..	Kyriakos Antoni	..	239
do.	..	Elegou Prokopi	..	274
do.	..	Eleni Demetri Kounalli	..	208
Ayios Andronikos	..	Spyros Yeoryi	..	65
do.	..	Christofis Hambi	..	240
Ayios Elias	..	Constantis Stylli	..	246
do.	..	Yeorgios Christodoulou	..	265
Ayios Seryios	..	Michael Antoni	..	284
Chatos	..	Ahmet Mustafa	..	206
do.	..	Ahmet Koja Ibrahim	..	285
Ephtakomi	..	Loizos Hambaka	..	219
do.	..	Photis Achillea	..	33
Galatia	..	Akil Mustafa Gonie	..	54
Kalopsidha	..	Yeoryios Antoniou	..	267
Kato Varosha	..	Demetris A. Maouris	..	244
Komi Kebir	..	Kyriakos Constanti	..	68
Kondea	..	Christos Hanni	..	269

<i>Village</i>		<i>Owner's name</i>	<i>Reg. No.</i>
Lefkoniko	..	Mehmed Salih	38
do.	..	Ch. Hj. Symeou	41
Leonarisso	..	Chrysanthos Panayi	56
Lysi	..	Minas Lysandrou	80
do.	..	Demetris Topha	227
Melanagra	..	Kallis Kyriakou	60
Ovgoros	..	Djafer Emin A. M. Mustafa	213
Paralimni	..	Andreas K. Xiouri	72
do.	..	Evangelis Haji Vraka	172
do.	..	Nicolas G. Tsiakouras	210
do.	..	Avraamis Anastasi	258
Peristeronopiysi	..	Andreas Louka	45
do.	..	Const. K. Haji Yeoryi	73
Phrenaros	..	Kyriakos Theori	71
Rizokarpaso	..	Panayiotis K. Sakka	171
do.	..	Christofis N. Koulia	241
do.	..	Pandelis N. Haji Hari	281
Sotira	..	Vasilis Demetri	252
Styllos	..	Annezou Nikou	269
do.	..	Kyriakos G. Voskou	282
Trikomo	..	Marikou Kyriakou	224
do.	..	Kyprianos Stylli Haili	266
Vatili	..	Andreas G. Iona	86
do.	..	Vasiliki Haji Christodoulou	89
Yialousa	..	Christofis Panayi Pitchi	280
LIMASSOL DISTRICT.			
Anoyira	..	Thoukis Solomi	143
Asgata	..	Demosth. Evangeli	119
Ay. Phyla	..	Costis P. Silikiotis	118
Limassol	..	Mehmed Mustafa	40
Pakhna	..	Theodoros Evgeniou	121
do.	..	Haralambos M. Kais	283
Phasoula	..	Nicolas Evangelis	272
PAPHOS DISTRICT.			
Dhrousa	..	Yiannis Sava	139
Istinjo	..	Ali Shoukri	292
Khoulou	..	Ahmet Kiazim	289
Kissonerga	..	Evangelis Haji Nicola	126
do.	..	Haji Towlis Haralambou	129
Kouklia	..	Mehmed Hassan Kokkinos	215
Ktima	..	Veli Tselebis	127
"	..	Ali Arif Kallikas	290
Kelokedhara	..	G. Christodoulou Sirimis	275
Lapithiou	..	Mehmed Mulla Osman	263
Lasa	..	Yeoryios Ch. Ellinas	130
Pano Arodhes	..	Harilaos Nicolaou	136
do.	..	Chrysost. Panayiotou	214
Peristerona	..	Solomon Haralambou	230
Prodromi	..	Avraamis Sava	248
Stroumbi	..	Sofoklis Constanti	178
Tala	..	Costis Papa Daniel	286

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
KYRENIA DISTRICT.				
Agri dhaki	..	Haralambos Yianni	..	147
Asomatos	..	Christallou Michaeli	..	146
do.	..	Antonis Haji I. Hanni	..	150
Ayios Amvrosios	..	Nicolas Haji Demetri	..	256
Bellapais	..	Savas K. Demetriades	..	236
Dhiorios	..	Gregoris Haji Michael	..	148
Dhikomo, Kato	..	Loukas G. Loukaides	..	273
Kyrenia	..	Shakir Hussein	..	158
Lapithos	..	Polyk. Panayioti	..	99
Larnaka tis Lapithou	..	Miltiades Constanti	..	152
do.	..	Kleanthis Stylianou	..	287
Myrtou	..	Cleov. Stylianou	..	149
Siaklipos	..	Lavithis Demetriou	..	232

1st December, 1938.

ROBERT J. ROE,
*Chief Veterinary Officer,
 Inspector of Horse Breeding.*

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Manager, Stock Farm, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis,

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Officer in charge of the Farm.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, including the Nursery Garden, Nicosia, and Officers are stationed at Kythrea, Dheftera, Morphou and Lefka.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA AND LIMASSOL DISTRICTS.

Agricultural Officer, Mr. M. Papaiaiovou, is in charge including Larnaca Nursery Garden. Officers are stationed at Larnaca, Skarinou, Nisou, Agros and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Kyprianides, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klokkaris, is in charge. Paphos District includes Paphos and Polis Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelo-kedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant.

Distribution of Pedigree Stud Animals on the 1st January, 1939.

<i>Thoroughbred Stallions:</i>	<i>Date of Birth</i>	
Marcher Lord	(1926) ..	at Athalassa.
Life Line	(1922) ..	at Athalassa.
Pitchford	(1925) ..	at Athalassa.
Friars Flutter	(1927) ..	at Larnaca.
Waterkoscie	(1923) ..	at Lefkoniko.
Moleskin	(1920) ..	at Vatili.
<i>Irish Draught Stallion:</i>		
Bright Boy.. ..	(1936) ..	at Athalassa.
<i>Dales Pony:</i>		
Sonny Boy.. ..	(1930) ..	at Polis.
<i>Dairy Shorthorn bulls:</i>		
No. 480 Ambassador ..	(1934) ..	at Agricultural Dept., Nicosia.
No. 487 Minstrel	(1935) ..	at Athalassa.
No. 498 Conqueror	(1936) ..	at Kyrenia (on loan).
No. 491 Prince	(1937) ..	at Athalassa.
No. 494 Archer	(1937) ..	at Larnaca.
No. 495 Aviator	(1937) ..	at Phlasou (on loan).

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**THE
CYPRUS
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1939

(Volume XXXIV)

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Loading of Oranges at Famagusta Harbour.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW
OF THE
AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

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EDITORIAL NOTES.

AGRICULTURAL SITUATION.

THERE has been an abundance of rain this winter and the condition of all winter crops is very favourable at present. Natural pastures are adequate and all flocks are in exceptionally good condition. There has been no serious disease of sheep and goats and milk supplies have been plentiful. Unusual activity in tree planting has been noticeable and the available supply of trees from Government and private nurseries has been largely exhausted.

* * * * *

THE RAINFALL.

Rainfall in 1938 was well distributed and was considerably above the average for the previous ten years.

The following table shows the rainfall at Nicosia month by month for the years 1937 and 1938 compared with the average for the ten years 1929-1938.

Rainfall at Nicosia.

Month	Year		Average for ten years 1929-1938 inches
	1937 inches	1938 inches	
January	5.78	2.94	3.71
February	0.61	2.33	2.47
March	0.02	0.76	0.74
April	0.51	1.01	0.06
May	2.20	1.71	1.13
June	—	0.03	0.17
July	—	0.10	0.01
August	—	0.95	0.13
September	0.02	1.53	0.41
October	0.97	1.43	0.57
November	2.79	1.10	1.18
December	0.06	4.62	2.30
	<u>12.96</u>	<u>18.51</u>	<u>12.88</u>

ORANGE DAYS.

Orange Days were celebrated at Famagusta and Lefka this year. The fifth annual Orange Day at Famagusta was held on 5th February, the main celebrations being centred at the Stadium. The event attracted large numbers of people from Nicosia and other towns. The outstanding features of the festival were the parade of cars decorated with sprays and fruits of citrus trees and the Greek dancing performed by girls dressed in old-fashioned Cypriot costumes. All the schools of Famagusta and Varosha paraded on the Stadium during the festival and the celebrations were thoroughly enjoyed by the crowds of Famagusta residents and visitors who were present.

The third Lefka Orange Day was held on the 5th March. The celebrations at Lefka were organized by the Mayor and Municipal Corporation of Lefka and an interesting programme of events was arranged to stimulate interest on the production and local consumption of citrus fruits.

* * * * *

ARBOR DAY.

The 19th Arbor Day was celebrated at Greek Schools on the 30th January and at Moslem Schools on the 27th January. The following statement shows the number of plants and seedlings issued in each District during the celebrations :—

District	Number of Plants issued to pupils		
	Fruit trees	Industrial seedlings	Forest seedlings
Kyrenia	1,942	880	1,239
Famagusta	3,658	1,469	8,325
Paphos	5,597	569	1,504
Nicosia	5,893	1,786	13,827
Limassol	4,849	200	4,371
Larnaca	9,687	132	2,407
Total	31,626	5,036	31,673

District	Number of Plants sold at the Arbor Day		
	Fruit trees	Industrial seedlings	Forest seedlings
Kyrenia	427	—	177
Famagusta	1,420	68	1,347
Paphos	1,480	310	30
Nicosia	1,420	78	611
Limassol	1,317	—	60
Larnaca	585	—	626
Total	6,649	456	2,851

AGRICULTURAL SHOWS IN 1939.

Proposals are under consideration to hold the following agricultural shows during the current year :—

<i>District</i>	<i>Proposed Show</i>	<i>Date</i>
Nicosia ..	.. Kythrea Agricultural Show ..	.. October.
do. ..	.. Peristerona Agricultural Show ..	.. October.
Famagusta	.. Peristerona-Piyi Animal Show ..	.. 26th March.
do.	.. Lysi Agricultural Show ..	.. 8th Sept.
Larnaca ..	.. Larnaca Poultry Show ..	.. December.
Limassol	.. Prodhromos Fruit & Vegetable Show ..	.. August.
do.	.. Pitsillia Agricultural Show ..	.. August.
Paphos ..	.. Paphos District Show Yeroskipos ..	.. 30th Sept.
Kyrenia ..	.. Kyrenia District Show ..	.. November.

* * * * *

APPOINTMENT OF AGRICULTURAL CHEMIST.

Dr. P. A. Loizides, of Nicosia, who has been studying in England for the past six years, has been appointed Agricultural Chemist in the Department of Agriculture. He is at present completing a further six months' special course in Agricultural Chemistry at Bangor University College, North Wales and Rothamsted Experimental Station. and is expected to take up his appointment in Cyprus about next September.

* * * * *

STUDY LEAVE.

Mr. K. Hamboullas, Agricultural Assistant in charge of the Trikoukkia Deciduous and Small Fruit Experiment Station, was granted six months' study leave from the 24th December, 1938. Mr. Hamboullas is at present undergoing a refresher course at the Royal Horticultural Society's Gardens, Wisley, where he was trained in deciduous fruit growing prior to the development of the Trikoukkia Experiment Station. It is hoped Mr. Hamboullas will be able to spend a short period of his study leave at the East Malling Research Station and the Agricultural and Horticultural Research Station, Long Ashton.

* * * * *

TRANSFER OF THE SUPERINTENDENT OF AGRICULTURE FROM NICOSIA TO CENTRAL EXPERIMENT FARM, MORPHOU.

The Headquarters of the Superintendent of Agriculture, Mr. H. M. James, were transferred from Nicosia to the Central Experiment Farm, Morphou, as from the 1st January, 1939. The Superintendent of Agriculture has assumed full charge of the Central Experiment Farm in addition to his normal duties of supervising the field staff.

This change has become necessary as the Central Experiment Farm has now passed the development stage. The management of the farm and expansion of the experimental work now demand greater attention.

* * * * *

TABLE 1.—(*Lattice Square Experiment, 1937-38.*)

MEAN YIELDS OF STRAW & GRAIN PER DONUM & ADJUSTED MEAN YIELD OF GRAIN.

Mean yield in okes per donum.

<i>Variety</i>	<i>Straw</i>	<i>Grain</i>	<i>Grain(adjusted)</i>
Persian red	211.5	123.75	138
Tripolitiko " A " *	209.0	126.25	118
Asprovroullos	167.0	100.25	110
Palestine	166.0	104.00	108
Tripolitiko " B " *	173.0	114.25	107
Jaljouli	159.0	98.75	105
Blé dur 231	165.0	97.50	105
Riverina	144.0	98.50	105
Nursi	190.5	116.25	105
Ford	163.0	105.00	104
Gluyas early	142.5	97.00	103
Dur Marocain	198.0	109.25	102
Kyperounda	150.0	102.50	100
Golden Ball Baladi	209.0	108.25	99
Rietti	143.0	82.25	97
Burrill	142.0	90.50	95
Pusa 4	150.5	109.00	94
Kenya Governor	122.0	85.50	94
Asprositara*	159.0	93.50	93
Ibei 292	117.0	78.00	93
Auja	215.5	101.75	92
Stei 7	146.0	89.25	89
Nabawa	133.0	94.25	89
Geeralying	117.0	87.75	89
Currawa	159.0	96.25	89
Blé dur Montgolfier	203.5	101.25	89
Blé dur 018	204.5	80.50	88
B.X.I.P.I.	120.0	89.75	87
Kambouriko*	175.5	91.75	87
Pellositaro*	172.0	80.50	87
Federation	132.5	87.25	83
Ibei 7	169.0	91.00	86
Hurani	140.0	89.25	84
Robbin	127.5	87.25	84
Psathas*	123.0	75.25	83
Mugrabi	162.5	85.00	80
Florence 135	150.0	79.75	79
Felix	144.5	75.50	78
Bel 31	132.5	70.00	78
Dur selectioné 250	127.5	70.00	77
Huguenot	214.5	84.25	77
Borowelling	120.0	75.00	76
Hamira 436	176.5	86.25	76
Clarendon	123.0	69.25	72
Mentana	95.5	66.75	72
Dundee	152.0	86.50	66
Amani	40.0	54.75	66
Hindi D	89.0	66.00	65
Murience Koi	146.5	68.50	63

In Table 1, local varieties are marked with an asterisk. (*)

Table 2 shows the yields of various varieties in 8×8 latin square trials held for three years.

TABLE 2.
(Latin Square 8×8)
WHEAT VARIETY TRIALS 1936-1938.

Variety	Yields of grain in okes per donum.			
	1936	1937	1938	
B.X.I.P.I.	42	111	75	
Gluyas Early	63	116	93	
Marocain 024	34	—	—	
Hamira 436	22	86	—	
Huguenot	18	94	—	
Rietti	24	98	—	
Psathas*	57	88	—	
Kyperounda*	43	99	—	
Tripolitiko*	—	106	—	
Hurani	—	—	75	
Palestine	—	—	109	
Kenya Governor	—	—	80	
Bel 31	—	—	61	
Mentana	—	—	70	
Blé dur 018	—	—	92	

In Table 2 the yields are very low for 1936 due to dry weather. The plots were irrigated in 1937 and 1938.

Table 3 shows the yields of various varieties grown on a larger scale at the Central Experimental Farm for 4 years. These varieties were picked out by eye as being promising and in each case plots of 5-25 donums were grown. This table may prove interesting in that the varieties were grown under normal farming conditions and the artificial experimental atmosphere was absent. The yields are given in kilés per donum, a kilé weighing 20-22 okes.

TABLE 3.—YIELDS OF VARIOUS VARIETIES GROWN IN BULK.

Variety	Yields in kilés per donum				
	1934-35	1935-36	1936-37	1937-38	Mean
Imported varieties :					
1. Gluyas Early	5.25	3.66	5.94	5.12	4.99
2. Stei 7	2.83	5.00	5.00	5.50	5.50
3. Dur selectioné 250	3.16	6.00	7.75	1.77	4.67
4. Florence 135	3.81	4.00	7.33	1.53	4.17
5. B.X.I.P.I.	6.09	9.45	8.47	3.94	6.99
6. Ibei 7	6.05	6.00	6.17	3.60	5.45
7. Hamira 436	8.60	6.87	4.12	7.30	6.47
8. Huquenot	4.50	5.86	6.00	2.40	4.69
9. Rietti	8.60	4.22	6.17	10.60	7.39
Local varieties :					
1. Kyperounda	4.09	4.59	4.93	4.62	4.56
2. Tripolitiko	3.81	5.53	6.66	6.79	5.69
3. Psathas	5.52	6.72	5.62	7.15	6.25

If tables 1, 2 and 3 are examined, it will be seen that one or other of the local varieties is among the highest yielders in each case. Certain of the imported varieties, however, are very promising and are well worth further trial. The variety B.X.I.P.I., for example, has been tried in many localities of Cyprus and its cultivation is increasing slowly. No varieties imported up to now show any *large* advantage in yield over the corresponding local variety and it will always be doubtful whether an imported variety will have the same adaptability to Cyprus conditions as a local type. Selection within the local varieties appears to have more promise than getting higher yielding varieties from abroad, but, as has been previously stated, experimental work with the imported varieties is continuing on surer lines.

Important points in connection with wheat varieties are earliness of maturity and resistance to disease. Morphou is not a bad rust district and the latter point has not yet been adequately examined. Table 4 shows the length of time from sowing to maturity taken by the various varieties grown on the farm in the season 1937-38. From table 4, it will be seen that the variety Pusa 4, which was imported from Australia, was earlier than the local early variety Psathas.

It should be noted that, owing to a dry spell, no variety appeared above ground until twenty days after sowing.

TABLE 4.—LENGTH OF TIME BETWEEN SOWING AND MATURITY.

<i>Number of days</i>		<i>Varieties</i>
146	..	Pusa 4.
148	..	Borowelling, Clarendon, Geeralying, Persian Red, Psathas, B.X.I.P.I., Gluyas Early.
150	..	Jaljouli, Palestine, Stei 7, Kenya Governor, Bel 31, Asprovroullos.
154	..	Nabawa.
155	..	Asprositario, Federation, Tripolitico A and B.
156	..	Amani.
157	..	Hindi D.
158	..	Ford, Blé dur 231, Huguenot, Currawa, Mentana, Nursi, Kyperounda.
161	..	Mograbi, Hamira 436, Kambouriko, Florence 135, Golden Ball Baladi, Dundee, Bobbin, Burrill, Felix, Riverina, Ble dur Montgolfier.
165	..	Hurani, Dur Selectioné 250, Rietti, Ibei 292, Dur Maroca in, Ibei 7, Auja, Blé dur 018, Murience koi 170, Pellositaro.

II. WHEAT FERTILIZER TRIALS.

A simple fertilizer trial with wheat has now been carried out for 5 successive years. The yields in the harvest of 1936 were practically nil for all treatments owing to dry weather and the failure of irrigation water, but these yields are included for the sake of completeness. The object of the trial was to see what happened to the yield of wheat when grown year after year on the same piece of land and fertilized in different ways. The yields of the various treatments for the harvests of 1934-1938 inclusive are shown in table 5.

TABLE 5.—WHEAT FERTILIZER TRIAL.

Fertilizer	Okes per donum	Yields of grain in okes per donum					
		1934	1935	1936	1937	1938	Mean
Nil	Nil	82.5	69.6	6.4	55.0	31.0	48.90
P	40	104.0	69.0	7.5	63.0	38.0	56.30
A/S+N/S	8+8	79.0	111.5	11.5	83.0	29.7	62.95
A/S+N/S+P	4+4+20	119.0	83.2	7.2	127.7	63.2	80.10
A/S+N/S+P	8+8+40	127.0	92.2	9.7	137.0	98.7	92.95
F.Y.M.	2,400	92.0	120.7	10.7	168.0	105.5	99.40
A/S+N/S+P	16+16+80	142.0	128.5	7.5	193.5	113.5	117.00

P= Superphosphate. A/S = Ammonium Sulphate (applied at sowing time).
N/S = Nitrate of Soda (as top dressing). F.Y.M. = Farmyard manure

The yields shown in table 5 are not as low as might be expected, if we take into consideration the failure in 1936. The average yield for five years of over 5 bushels to the donum, obtained in the plots with the heaviest dose of artificials, is very good. However, the economics of growing wheat after without any rotation is shown in table 6.

At the Central Experimental Farm, it has been found that when wheat is grown year after year on the same piece of land, the cost of production, exclusive of fertilizers is 27s. per donum, which sum includes 10s. 6p. of overhead charges, representing interest on the capital value of the land. The cost of production was arrived at as follows :—

COST OF GROWING WHEAT AT CENTRAL EXPERIMENTAL FARM.

	£	s.	p.
1st ploughing (tractor)	—	1	5
2nd ploughing with 2-furrow plough (mules) ..	—	1	4
Value of seed (14 okes at 2p.)	—	3	1
Broadcasting seed	—	—	1
Harrowing	—	—	3
Cross-harrowing	—	—	2
Rolling	—	—	1
One irrigation (labour and value of water) ..	—	4	6
Harvesting with binder	—	1	3
Threshing with thresher	—	3	4
Overhead charges for 12 months at 8p. per month	—	10	6
Total	£1	7	0

This figure may be compared with that of 22s. given in *Surridge's Survey of Rural Life in Cyprus*, for cost of production by peasant methods.

If we add the cost of fertilizers to this figure in the case of each treatment, it is possible to estimate its original value. The various values in the following calculations are :—

Sulphate of ammonia	—/ 2.4p. per oke
Nitrate of soda	—/ 2.2p. „
Superphosphate	—/ 0.85p. „
Farmyard manure	—/ 1.0p. per load (50 okes).
Wheat	—/ 2.0p. per oke.

TABLE 6.—FINANCIAL VALUE OF FERTILIZER TREATMENTS.

(Calculation per Donum for Mean of 5 Years.

Fertilizer	Okes per donum	Cost of fertilizer	Total cost of production	Value of produce	Loss
Nil	Nil ..	Nil ..	27/- ..	10/8 ..	16/1
P.	40 ..	3/7 ..	30/7 ..	12/5 ..	18/2
A/S+N/S ..	8+8 ..	4/1 ..	31/1 ..	14/- ..	17/1
A/S+N/S+P ..	4+4+20 ..	4/- ..	31/- ..	18/- ..	13/-
A/S+N/S+P ..	8+8+40 ..	8/- ..	35/- ..	20/6 ..	14/3
F.Y.M.	2,400 ..	48/- ..	75/- ..	23/- ..	52/-
A/S+N/S+P ..	16+16+80 ..	16/- ..	43/- ..	26/- ..	17/-

In each case, a substantial loss is shown which testifies to the inadvisability of growing successive crops of wheat. The largest loss is from plots manured with farmyard manure. Part of this loss may be due to the late application of this manure. A set of plots will be added to this experiment including various levels of a complete fertilizer containing nitrogen, phosphoric acid and potash.

It will be interesting to see how long yields can be kept up to the 5 bushel mark by the heavy dose of artificial fertilizers. It must not be lost sight of that if wheat prices were to soar, in wartime for example, growing 2, 3 or more successive crops of wheat might become a profitable enterprise.

Wheat in Cyprus is often grown following the cotton crop. A fertilizer trial was laid down in the 1936-37 season to compare the value of various fertilizers on wheat following cotton. The different treatments and the yields of wheat per donum are shown in Table 7.

TABLE 7.—EFFECTS OF FERTILIZERS ON WHEAT GROWN AFTER COTTON (1936-37).

Fertilizer	Okes per donum	Yield of grain
Nil	Nil ..	54
F.Y.M.	2,400 ..	72
S/A	25 ..	123
4:12:3	60 ..	127
S/A+N/S	16+8 ..	141
S/A+N/S+P ..	16+8+40 ..	151

The most interesting point in Table 7 is the increased yield when nitrogen is applied in two dressings over nitrogen applied in one dose. The financial implications of Table 7 are shown in Table 8.

TABLE 8.

Fertilizer	Okes per donum	Cost of fertilizer	Total cost of production	Value of produce	Loss
Nil	Nil ..	Nil ..	27/- ..	11/8 ..	15/1
F.Y.M.	2,400 ..	48/- ..	75/- ..	16/1 ..	58/8
S/A	25 ..	6/6 ..	33/6 ..	27/3 ..	6/3
4:12:3	60 ..	9/- ..	36/- ..	28/3 ..	7/6
S/A+N/S	16+8 ..	6/2 ..	33/4 ..	31/3 ..	2/1
S/A+N/S+P ..	16+8+40 ..	10/- ..	37/- ..	33/6 ..	3/3

Once again, part of the loss due to farmyard manure may be due to the late application. The effect is also residual, but to what extent is not yet ascertained. A loss is shown for all treatments, but only a very small one for the Nitrate of Soda and Ammonia Sulphate treatment. Further experiments have now been laid down to see what effects will be shown by varying the amounts and proportions of the nitrogenous dressing.

III. ROTATIONS WITH WHEAT.

The simplest rotation, and the one most widely used in Cyprus, is wheat alternated with bare fallow. Two developments of this are (1) wheat alternated with a legume, ploughed in the green stage as a green manure, and (2) wheat alternated with a legume, which is harvested and the stubble ploughed in. A 4×4 latin square trial, comparing these three rotations with wheat grown year after year was laid down in 1934. In 1934 all plots were sown with wheat (following a bare fallow). In 1935, the various alternating crops were grown followed by wheat in 1936, which was a failure for the reasons described previously. The yields in 1937 and 1938 are given in Table 9.

TABLE 9.—WHEAT ROTATION TRIAL.

Yields in okes grain per donum

<i>Treatment</i>	1937	1938	<i>Total (wheat)</i>
A. Bare fallow—wheat ..	— ..	102 ..	102
B. Green manure—wheat ..	— ..	127 ..	127
C. Legume (harvested)—wheat	50 okes vicos	67 ..	67
D. Wheat—wheat ..	80 „ „	30 ..	110

No fertilizers were given to any treatment. The financial values of these treatments are shown in Table 10.

TABLE 10.—FINANCIAL VALUE OF UNFERTILIZED TWO-COURSE ROTATIONS.

(Calculations per Donum for two Years)

<i>Treatment</i>	<i>Total cost for 2 years</i>	<i>Value of produce</i>	<i>Loss</i>
A. Bare fallow—wheat ..	.. 39/5	.. 22/6	.. 16/8
B. Green manure—wheat ..	.. 41/8	.. 28/-	.. 13/8
C. Legume (harvested)—wheat ..	.. 42/8	.. 32/-	.. 10/8
D. Wheat—wheat.. ..	.. 54/-	.. 24/4	.. 29/6

Table 10 shows that here again, with simple two-course rotations, a substantial loss is shown. The following points in connection with these calculations should, however, be noted.

1. The treatments bear overhead costs to the value of £1. 1s. 3p. per donum for the two years. These overhead costs would be less for the Cypriot peasant, but probably quite as great for the settler farming on a medium to large scale.

2. The loss on wheat grown consecutively will probably increase year by year.

3. In 1938, the yield from treatment B. is not statistically higher than that from treatment A., although both are statistically better than C. and D.

The results shown in the experiments described in Section II and III are negative, but they tend to point out various lines of investigations to be followed. We have still to find out the financial benefit, or otherwise, of the following :—

- (1) Rotations for 3 years and upwards.
- (2) Fertilized rotations.
- (3) Variations of the two-course rotations.

These three points are receiving attention and it may soon be possible to reach some more positive conclusions about the fertilizing and rotations most suitable for wheat. It may be opportune to state here that, on any farm where overhead costs are a consideration, devoting two years to production of one crop of wheat (such as the wheat-fallow rotation) is unlikely to be a paying proposition.

IV. WHEAT CULTIVATIONS SEED-RATES, Etc.

Apart from rotations and fertilizers, wheat requires skilled cultivation. Trials are now being laid down for the purpose of comparing various methods of preliminary cultivation and their effect on the wheat crop. This type of trial, however, is very difficult to lay down satisfactorily and needs many years before results can be properly analysed. One trial, comparing cultivation with different types of ploughs has been discarded and preparations for a more useful experiment are being carried out this year.

The sowing of wheat can be carried out either by broadcasting or sowing in drills. In Cyprus the usual rate for broadcasting seed is 12 okes per donum. In a trial carried out for three years the yields of wheat were quite unaffected by three different seed rates as the following Table 11 shows :—

TABLE 11.—WHEAT SEED-RATE TRIAL.

<i>Seed-rate</i> (oke ls. per donum)					<i>Yield per donum</i> (means of 3 years)	
—					—	
9	..	..	..	..	111 okes	grain per donum
11	..	..	..	..	113	„ „
13	..	..	..	..	114	„ „

Seed rates of 7 okes per donum and 15 okes per donum have also been compared with no difference in results.

A trial carried out in 1937–1938 compared the yields of wheat sown broadcast and in drills, with the following result :—

TABLE 12.—WHEAT TYPE OF SOWING TRIAL.

<i>Treatment</i>					<i>Okes of seed</i> <i>per donum</i>		<i>Yield in okes</i> <i>grain per donum</i>	
—					—		—	
Broadcast	..	..	..	..	12	..	76	
Drilled with rows 8" apart	..	..	..	..	10.5	..	77	
„ „ „ 14" „	..	..	..	..	6	..	81	
„ „ „ 20" „	..	..	..	..	4.5	..	82	

This trial bears out the results of the previous trial in that the seed rate appears to have little if any effect on the yield of wheat. The differences in the yields in both cases are statistically insignificant,

In the same trial it was shown that cultivation of unirrigated wheat fields, after sowing, markedly increased the yield. When the plots received an irrigation, however, there was no increase in yield due to hoeing. This trial will be continued for some years in order to find if these results will remain constant.

V. BARLEY VARIETIES.

Cyprus is fortunate in the possession of the two barley varieties "Paphitico" and "Cyprus Black," which are normally high-yielding and well adapted to local conditions. Trials comparing these varieties with different imported varieties have now been carried out for three years.

TABLE 13.—YIELDS OF BARLEY VARIETIES (MEANS OF 3 YEARS).

Varieties							Yields per donum (okes grain)
—							—
4 A ..	..	..	..	..	..	..	151
Paphitico ..	..	..	..	..	..	..	150
Egyptian ..	..	..	..	..	..	..	144
Cyprus Black ..	..	..	..	..	..	..	141
S.A. ..	..	..	..	..	..	..	140
Mariotti ..	..	..	..	..	..	..	138

The variety "4 A" is a two-rowed barley, which has been grown for several years in various localities of Cyprus outside the farm and is considered to be very satisfactory. For the present, however, much larger sowings of the "4 A" variety do not appear to show much advantage, but seed can be purchased at the farm by interested persons wishing to try it.

VI. COTTON VARIETIES.

The aim of this series of experiments is to find a variety or varieties of good quality and suitable for Cyprus conditions, to replace the existing local varieties "Thriamvos," "Titsiros" and "Lapithos." The objection to "Thriamvos" and "Titsiros" is that neither of them is a true variety, but an admixture of imported types, all fuzzed seed varieties being grouped under the name "Thriamvos" and the naked seed varieties, under the name "Titsiros." Lapithos cotton, a *Herbaceum* cotton, chiefly suiting the village Lapithos conditions, was kept pure owing to the fact that it is a perennial cotton and botanically different from the other varieties.

Egyptian varieties require a long growing season and constant irrigation. Under Cyprus conditions they produce small bolls and are liable to heavy attacks by boll worms.

Indian varieties do well but are of poorer quality than the existing local varieties.

American varieties are the best suited for Cyprus conditions and some of them have good quality lint.

TABLE 14.—YIELDS OF COTTON VARIETIES GROWN AT CENTRAL EXPERIMENTAL FARM.

Variety	Okes per donum					Lint length in millimetres
	1934	1935	1936	1937	1938	
<i>Egyptian :</i>						
Gizeh 2 ..	84.45	81.19	154.00	131.00	—	—
Gizeh 3 ..	41.25	59.27	—	—	—	—
Gizeh 7 ..	69.55	68.18	130.00	125.50	—	—
Nahda ..	33.50	52.76	—	—	—	—
Sakha 2 ..	27.00	76.73	—	—	—	—
Sakha 4 ..	31.55	62.01	—	—	—	—
Sakellarides	41.25	43.16	—	—	—	—
<i>American :</i>						
U.4. ..	80.12	83.25	132.00	—	—	—
Mesowhite ..	87.50	93.65	125.00	133.00	85.68	32.00
Wids 7 ..	—	—	—	163.00	92.00	33.52
Cocker 100 ..	—	—	—	177.50	120.10	33.56
Cleewilt 5 ..	—	—	—	177.25	93.10	41.26
Wilds 8 ..	—	—	—	139.25	97.20	40.67
Wilds 12 ..	—	—	—	—	101.20	30.65
Cleewilt 7 ..	—	—	—	—	96.00	33.52
<i>Indian :</i>						
Gadaz ..	—	—	140.00	—	—	—
<i>Local :</i>						
Cyprus select	26.50	79.48	130.00	—	—	—
Titsiros ..	—	117.58	131.00	—	62.00	—
Thriamvos ..	—	—	—	—	74.00	—

VII. COTTON, DATE OF SOWING TRIALS.

Experiments have proved that cotton should be planted before the end of April, starting, if weather conditions are favourable, from the beginning of March.

TABLE 15.

Date of sowing	Yield in okes per donum					
	1934	1935	1936	1937	1938	
Middle February	—	—	—	—	—	—
End ..	—	—	—	—	—	—
Middle March ..	99.33	119.70	178.70	94.60	169.30	—
End ..	94.16	135.68	171.00	—	—	—
Middle April ..	83.33	128.90	163.00	139.20	170.30	—
End ..	80.33	90.64	175.00	—	—	—
Middle May ..	50.83	60.00	156.00	56.80	136.00	—
End ..	—	—	125.00	—	—	—

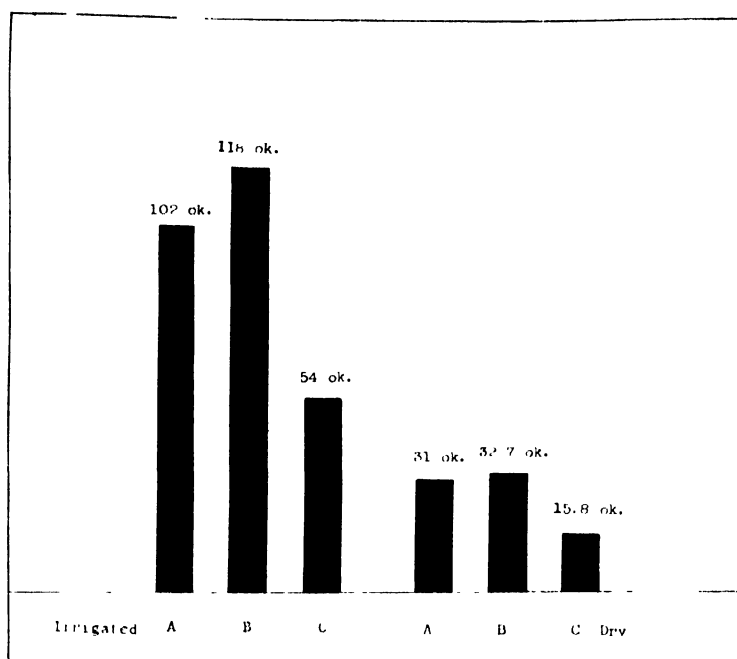


DIAGRAM SHOWING RESULTS OF IRRIGATED AND UNIRRIGATED COTTON SOWN AT DIFFERENT DATES.

<i>Irrigated</i>		<i>Unirrigated</i>
A = Middle March	..	A = Middle April
B = Middle April	..	B = 6th May
C = Middle May	..	C = End May

VIII. COTTON IRRIGATION TRIALS.

(a) *Quantity of Water per Donum.*—The water in this experiment is measured before reaching the trial plots, by a special water-meter, and then conducted in open concrete channels. The length of the concrete channel from the water-meter to the plots is 140 yards and it is estimated that loss of water by evaporation is negligible. The quantities tried are 10,000, 20,000, 30,000 and 40,000 gallons per donum. The ridges are made at $2\frac{1}{2}$ feet distance and approximately 9 inches deep. Such ridges, when irrigating at the rate of 40,000 gallons per donum, can just hold the water. A total of 8 irrigations has been given every season.

The results have shown that the yield increases as the quantity of the water is increased.

TABLE 16.—YIELDS OF COTTON PER DONUM WITH DIFFERENT QUANTITIES OF WATER.

Quantity of water per donum	Yield in okes per donum				Mean.
	1936	1937	1938		
10,000 gals. ..	97.00 ..	103.00 ..	55.50 ..		85.20
20,000 „ ..	148.00 ..	160.00 ..	83.50 ..		130.50
30,000 „ ..	174.00 ..	188.00 ..	120.50 ..		160.80
40,000 „ ..	206.00 ..	205.00 ..	147.00 ..		186.00

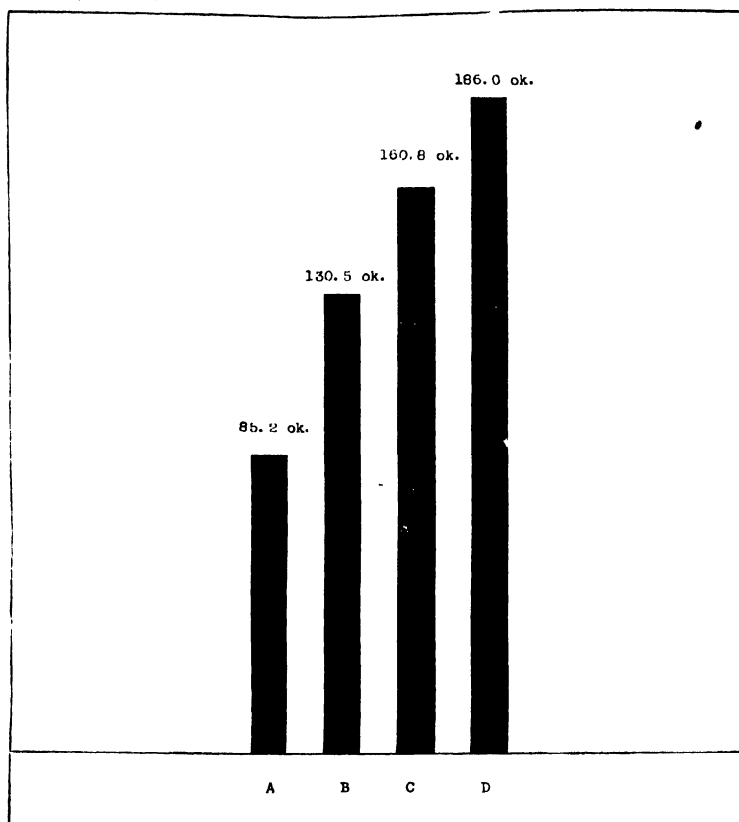


DIAGRAM SHOWING RESULTS OF IRRIGATING COTTON WITH DIFFERENT QUANTITIES OF WATER.

Experiment A.= 10,000 gals. of water per donum
 „ B.= 20,000 „ „
 „ C.= 30,000 „ „
 „ D.= 40,000 „ „

(b) *Frequency of Irrigation.*—30,000 gallons of water per donum were given every 12, 15, 18 and 21 days up to end of August, and though the experiment was repeated for two years there were no significant differences between treatments.

TABLE 17.—YIELDS OF COTTON PER DONUM AT DIFFERENT INTERVALS OF TIME.

30,000 gals. of water given every	No. of Irrigations	Yields in okes per donum		
		1936	1937	Mean
12 days	11 ..	187.00 ..	74.50 ..	130.75
15 days	9 ..	147.00 ..	153.00 ..	150.00
18 days	8 ..	171.00 ..	117.36 ..	144.18
21 days	7 ..	153.00 ..	205.00 ..	189.00

IX. COTTON FERTILIZER EXPERIMENTS.

The 1936 and 1937 experiments were laid down in $2 \times 2 \times 2$ complex experiments, the eight treatments being, no fertilizer, N, P, K, NP, NK, PK, NPK. The 1938 one was laid down as $3 \times 3 \times 3$ complex the main treatments being three dates of planting, three distances, three levels of Nitrogen (no nitrogen, 20 okes of S. of ammonia, 40 okes of S.A.). Response to Nitrogen was significant.

TABLE 18.—YIELDS OF COTTON PER DONUM WITH DIFFERENT TYPES AND AMOUNTS OF FERTILIZERS.

Fertilizer	Quantity in okes per donum	Yield in okes per donum		
		1936	1937	1938
No fertilizer	—	112.00 ..	143.00 ..	133.30
N.	20 ..	142.00 ..	178.50 ..	168.10
N.	40 ..	— ..	— ..	196.60
P.	60 ..	161.00 ..	169.00 ..	—
K.	11 ..	130.00 ..	— ..	—
K.	20 ..	— ..	146.00 ..	—
NP.	20+60 ..	161.00 ..	191.50 ..	—
NK.	20+11 ..	144.00 ..	— ..	—
NK.	20+20 ..	— ..	183.00 ..	—
PK.	60+11 ..	160.00 ..	— ..	—
PK.	60+20 ..	— ..	161.00 ..	—
NPK.	20+60+11 ..	174.00 ..	— ..	—
NPK.	20+60+20 ..	— ..	193.00 ..	—

N = Sulphate of Ammonia.

P = Superphosphate.

K = Sulphate of Potash.

X. COTTON SPACING EXPERIMENTS.

The 1935 and 1936 experiments were laid down as 4×4 latin squares, whilst the 1937 and 1938 as $3 \times 3 \times 3$ complex trials, spacing being one of the factorial treatments. Results showed no significant difference between different spacings.

TABLE 19.—YIELDS OF COTTON PER DONUM WITH DIFFERENT DISTANCES.

<i>Distance between plants</i>				<i>Yield in okes per donum</i>			
				1935	1936	1937	1938
5 inches	..	..	..	—	103.00	90.00	157.00
10 "	..	..	..	79.00	110.00	90.00	173.00
15 "	..	..	..	91.00	113.00	92.00	166.00
18 "	..	..	..	82.00	—	—	—
<i>Distance between ridges</i>							
2 feet	..	..	..	..	84.00		
2 feet 3 inches	..	..	..	..	98.00		
2 " 6 "	..	..	..	..	95.00		
3 "	..	..	..	..	93.00		



CENTRAL EXPERIMENTAL FARM.

Section of Wheat Variety Trials, 1939.

XI. COTTON METHOD OF PLANTING TRIAL.

There are three methods of planting cotton in Cyprus : (a) broadcasting the seed ; (b) planting after the plough or drilling ; and (c) planting on ridges. The general methods adopted by farmers are (a) and (b), but (c) has such advantages as economy of water, economical and effective hoeing, economy of seed. The aim of the experiment which was started in 1938, and will be continued, is to find out whether in adopting the ridge method higher yield could also be obtained.

The 1938 experiment results are in favour of ridge method,

TABLE 20.—YIELDS OF COTTON PER DONUM WITH DIFFERENT METHODS OF PLANTING.

<i>Treatment</i>					<i>1938 okes per donum</i>
—	—	—	—	—	—
Ridges	..	..	..	..	129.25
Broadcasting	..	..	..	..	109.50
Drilled	..	..	..	..	123.50
Drilled and then ridge	..	..	..	..	111.25

XII. COTTON DRY CULTIVATION TRIAL.

The following experiments were carried out in 1937 and 1938 under dry conditions. The field was flooded well before the planting season and then ploughed three times. No further irrigations were given up to harvest.

TABLE 21.

<i>Treatments</i> <i>Varieties</i>					<i>Yield in okes per donum</i>	
	—	—	—	—	1937	1938
Mesowhite	..	..	..	..	91.80	18.20
Giza 2	..	..	..	..	62.28	—
Titsiros	..	..	..	..	88.25	—
Cocker 100	..	..	..	..	—	31.12
Cleviewilt 5	..	..	..	..	—	19.00
Triumph	..	..	..	..	—	22.80
<i>Date of Planting :</i>						
13.4	..	..	..	..	..	30.90
6.5	..	..	..	..	..	32.75
31.5	..	..	..	..	..	15.80
<i>No. of plants per hole :</i>						
2 plants per hole	..	..	..	..	84.29	
4 „ „ „	..	..	..	..	79.54	
Over 4 plants	..	..	..	..	79.37	
<i>Way of Planting :</i>						
Holes	..	..	..	..	81.30	
Ridges	..	..	..	..	80.83	

Progress Report on Soil Erosion Experimental Demonstrations.

IN THE MARCH, 1938, issue of this *Journal* a note was published giving a brief description of the objects of demonstrations on soil conservation in five representative areas of the Island and of the methods of carrying them out.

Owing to the hilly nature of the Island, special attention has been given to tree planting and the practice of contour farming. The stimulation which active work on soil conservation has given to tree planting has necessitated a considerable extension of the nursery work of the Department of Agriculture. Arrangements have been made for the mass production of carob, almond and forest trees at all existing nurseries and the three new nurseries to be established at Lysi, Kokkini Trimithia and Kelokedhara in 1939. The vine nurseries have also been extended to produce larger supplies of rooted vine cuttings, especially of the Sultana, Malaga and Rozaki varieties. Another noteworthy nursery activity is the establishment of the olive nursery at Vallia Forest. This scheme is an important step for the improvement and extension of the olive industry. The Vallia forest consists of approximately 1,000 donums of wild olive trees and is one of the best sources of supply of olive grafting stocks. In the past wild olives were extracted by the growers from this forest under permit, but last year arrangements were made with the Forest Department for the Department of Agriculture to control the issues of all ungrafted trees from this area and to carry out an organized rotational scheme of grafting. It is expected that, when the scheme is in full operation after three years, there will be available for distribution up to 10,000 grafted olive trees per annum. A limited supply of grafted trees may be available for issue in 1940 and ungrafted trees continue to be issued under strict control pending the production of an adequate supply of grafted trees suitable for issue.

The question of contour planting of vines and fruit trees has received close study and attention and the methods described by Mr. E. S. Clayton (now Director of the Soil Conservation Service of New South Wales) in the *Agricultural Gazette* of New South Wales for July, 1934, and by Mr. J. A. Ballantyne in December, 1936, and January, 1937, numbers of that *Journal*, have been adapted to Cyprus conditions. A number of "home-made" contour levels have been made and issued to Agricultural Officers for demonstrational use. A "road tracer" has also been used, to some extent, in locating contours on steep hillsides.

The progress of tree planting and anti-erosion demonstrations has been closely followed by Government and His Excellency the Governor recently gave directions for the publication of a notification in the *Cyprus Gazette*, summarizing the work done at the soil erosion demonstration areas in 1938 and describing the method of contour planting of vines and fruit trees.

The following is an abstract from the *Cyprus Gazette* dated 10th February, 1939, of Notice No. 114 :—

" TREE PLANTING.

HIS Excellency the Governor desires the following notification to be made for general information, and with a view to enlisting the collaboration of public bodies and of private individuals.

I. Government is endeavouring, through the Commissioners, District and Village Councils, and the administration staff, to develop and extend the practice, which has produced such good results in recent years, of planting avenues of trees alongside all roads both Main Roads and District Roads.

II. The Director of Agriculture is extending his system of nurseries for fruit and other trees, in order to ensure a larger supply of trees for Tree Planting Areas.

It is hoped that the inhabitants of all those villages in which as yet there are no Tree Planting Areas, will discuss the feasibility of reserving Tree Planting Areas with the Commissioner of their District.

III. A report by the Department of Agriculture on experimental work in terracing and tree planting carried out in 1938 for the purpose of preventing erosion, is subjoined for the information of the public, together with a note on the method adopted for the contour planting of vines and fruit trees.

REPORT BY THE DEPARTMENT OF AGRICULTURE ON ANTI-SOIL EROSION DEMONSTRATIONS, 1938.

Representative areas were selected in five Districts and a schedule of the objects and methods of carrying out the demonstrations was drawn up after consultation with the Commissioner of each District. The supervision of the work in the demonstration areas was placed under the direct control of the Agricultural Officer of the District concerned with the exception of Paphos District where the demonstration area was under the control of the Assistant District Inspector, Rural Development Area.

An allotment of £30 was made to each area and further assistance was given by supplying large quantities of trees and other planting material.

Special attention was given to cultivating and planting on the contour and a contour level adapted from the type used in Australia was made for each area. Special instructions on the use of the contour level were given to each officer. A copy of the instructions is attached for information.

The following is a summary of the work done in each area :—

Aradhippou, Larnaca District.—13,930 feet of contour furrows were prepared on the hill-slope of the water-shed and planted with acacia. The slopes of the main drainage area were planted with acacia, eucalyptus, cypress trees and perennial pasture grasses. Protective furrows were made on the boundaries of the cultivated fields and some of the poorer agricultural lands were planted with trees. 1,460 carob, 209 olive and 210 almond trees were issued and planted.

Paralimni, Famagusta District.—An area of 120 donums near Paralimni village and representative of the agricultural lands of the Paralimni peninsula in an advanced stage of erosion was selected. This area was terraced and 3,526 feet of terraces were constructed. The cost of reclamation of this land by terracing was 5s. per donum. The work of reclamation has created considerable interest amongst the village land holders.

Tymbou, Nicosia District.—The main valley passing through the village lands was selected and work was started to reclaim the gully which was causing serious damage to the alluvial deposits in the valley. 1,570 feet of stone terraces and 1,800 feet of canes were planted to protect the drainage bed. 70 donums of unproductive land were planted with forest trees and 113 olive trees were planted on the agricultural land.

Kopiambey, Kalokhorio, Limassol District.—An area was selected where vines are usually planted on steep slopes without terracing, owing to the absence of stones for the purpose. The system of planting vines in contour furrows was demonstrated and 4,500 feet of these were constructed and planted with vines.

Ayios Nikolaos, Rural Development Area, Paphos District.—Five representative plots were selected:—

- (a) For tree planting on lands unsuitable for agriculture.
- (b) For efficient terracing on steep slopes.
- (c) For protecting boundaries on road and drainage banks.
- (d) For protection of stream banks.
- (e) For control of gullies.

200 feet of furrows along stream banks were planted with canes, 900 feet of terraces were built on agricultural land, 500 feet of contour earth ridges were made in vineyards on steep slopes and the following forest and fruit trees were planted in the area: 550 cypress, 250 eucalyptus, 200 pine, 200 almond, 60 walnut, 34 apple and 13 apricot.

CONTOUR PLANTING OF VINES AND FRUIT TREES.

A simple and effective manner of locating the contour line for carrying out erosion measures by means of contour ploughing, contour banks and contour planting is by the use of a "home-made" contour level adapted from the *Agricultural Gazette* of New South Wales, July, 1934, December, 1936, and January, 1937.

This level consists of a framework of light timber and a spirit level constructed according to the design and dimensions shown in Diagram 1 attached.

One leg of the level is 3" shorter than the other so as to give a fall of 3" in 16' 8" or 1' 6" in every 100' to allow drainage. The fall is from the shorter leg (marked U) to the longer leg (marked L) so that the direction in which the longer leg is pointing indicates the line of fall.

In locating a contour line on a slope it is necessary to ascertain first the direction in which any surplus water must be carried off. When this has been decided, a point is selected in the middle of the slope and the first contour is marked by pegs in the direction of the fall.

When this has been done, a line at right angles to the contour is made, and measured points are marked on this line from which new contours will commence as shown on Diagram 2.

When all the contours have been pegged out on the slope, they are marked by means of a light plough or hoe. The pegs, except those marking the line at right angles to the contour, are then removed and two parallel lines are marked, one at the top and one at the bottom of the slope at right angles to the line of pegs which was left. The distances apart at which the trees or vines are to be planted are marked on the parallel lines. The points at which lines drawn between corresponding points on the parallel lines intersect the contours then indicate the positions at which the vines or fruit trees should be planted. (See Diagram 3.)

Where the contour lines are much curved, it will be necessary to vary the distances marked off on the two parallel lines. In general these distances will diminish towards the ends of the lines.

It may also be necessary to cut short one or two of the contour lines where the width between contours decreases in accordance with the fall of the land.

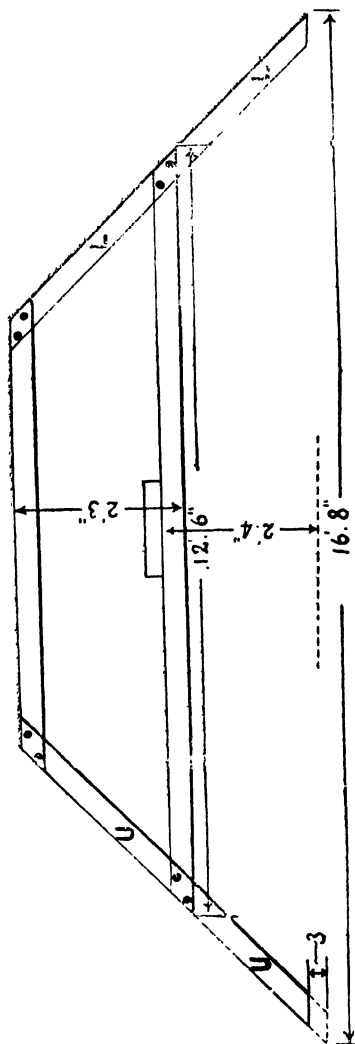


DIAGRAM I.—"HOME-MADE" CONTOUR LEVEL.

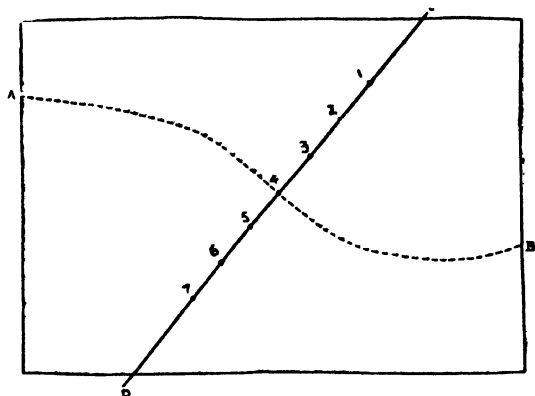


DIAGRAM II.—SHOWING MARKING OF FIRST CONTOUR.
Line A—B, 1st contour. Line C—D, line at right angles to contour. Points 1 to 7, points from which contours will commence.

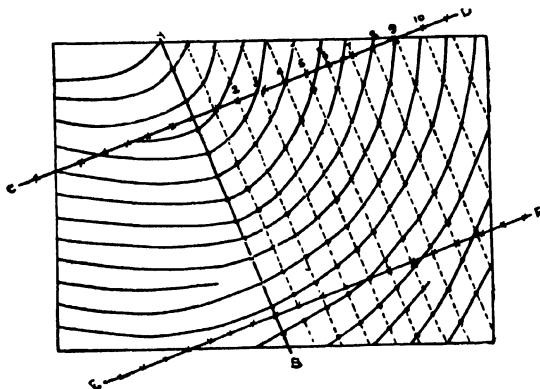


DIAGRAM III.—SHOWING SETTING OUT OF VINEYARD OR ORCHARD.
A—B, original line at right angles to contour. C—D & E—F, parallel lines at right angles to A—B. 1 to 10 distance apart of vines or fruit trees.

Where a line from corresponding numbers crosses the contour, this marks the position for planting."

The five soil erosion demonstration areas established in 1938 are being maintained and in some cases extended in 1939 and five additional areas are being started in 1939.

No direct work has been attempted so far by the Department of Agriculture to control grazing and limit the numbers of sheep and goats, but this problem continues to be the subject of study. Combined with these investigations, the animal husbandry branch and the botanical section are actively pursuing problems relating to the increased production of fodder crops and the improvement of herbage species.

The work on soil conservation in Cyprus has been conducted by Mr. A. Pitcairn, Assistant Director of Agriculture, who has devoted considerable time during the past two years to instructing the agricultural staff in methods of combating soil erosion and to advising on methods of utilizing land so as to protect it from this menace.

ADDITIONS TO A FIRST LIST OF CYPRUS FUNGI.

BY

R. M. NATTRASS, *Late Plant Pathologist.*

AND

P. PAPAIOANNOU, *Laboratory Assistant.*

The following additions to A FIRST LIST OF CYPRUS FUNGI comprise those fungi collected up to May, 1938, when the senior author (R. M. N.) left Cyprus, and determined by the Imperial Mycological Institute.

PHYCOMYCETES.

Bremia tulasnei (Hoffm.) Syd., on leaves of *Senecio vulgaris* L., Nicosia, April 1938 [915].

Cunninghamella echinulata (Thaxter) Thaxter, isolated from root of *Vicia faba* L., Yermasoyia, February 1938 [982].

Peronospora arthuri Farl., on leaves of *Clarkia elegans* Dougl., (cult.), Nicosia, April 1938 [910].

No previous record on *Clarkia* but this is the only species listed on the *Onagraceae*. (G. R. B.)

— **effusa** (Grev.) de Bary (—*P. muralis* Gäum.), on leaves of *Chenopodium murale* L., Dhenia, December 1937 [920].

— **parasitica** (Pers.) Fr. (= *P. sisymbrii-officinalis* Gäum.), on leaves of *Sisymbrium irio* L., Nicosia, February 1938 [913].

— **rumicis** Corda, on leaves of *Emex spinosa* (L.) Campd., Nicosia, March 1938 [912].

— **trifoliorum** de Bary (—*P. aestivalis* Syd. in Gäum.), on leaves of *Medicago* sp., Nicosia, March 1938 [933].

— **viciae** (Berk.) de Bary (= *P. lentis* Gäum.), on leaves of *Lens esculenta* Mönch., Dheftera, February 1938 [916]. (additional host).

Rhizopus nigricans Ehrenberg, in heads of *Brassica oleracea* var. *Botrytis* L., Kyrenia, November 1937 [937]. (additional host.)

Causing destruction of the heads.

ASCOMYCETES.

Rosellinia necatrix (Hart.) Berl., *Dematophora* only, on roots and haulms of *Solanum tuberosum* L., Trikoukkia, June 1937 [934]. (additional host.)

USTILAGINALES.

- Entyloma calendulae** (Oud.) de Bary, on leaves of *Calendula persica* C. A. M., Nicosia, February 1938 [891].
- Sorosporium punctatum** Malençon & Yen, in inflorescence of *Panicum repens* L., Kythrea, December 1937 [886].
- Urocystis gladioli** (Req.) W. G. Smith (= *Tubercinia gladioli* (Req.) Liro), in leaves of *Gladiolus segetum* Ker Gawl., Kophinou, March 1938 [902].

UREDINALES.

- Melampsora euphorbiae-gerardianae** W. Müller, uredo and teleuto, on leaves and stems of *Euphorbia arguta* Soland, Phasouri, April 1938 [906]. (additional host).
- Puccinia anomala** Rost., uredo and teleuto, on leaves of *Hordeum spontaneum* Koch, Athalassa, April 1938 [911]. (additional host).
- **barbeyi** (Roum.) Magn., aecidia and teleuto, on leaves of *Asphodelus fistulosus* L., Famagusta, January 1938 [889].
- **graminis** Pers., uredo and teleuto, on leaves, sheaths and culms of *Avena orientalis* Schreb., Nisou, June 1938 [928]. (additional host).
- **notobasidis** Gonz. Frag., (= *P. notobasidis* Politis), teleuto only, on stems, leaves and flowers of *Cercium syriacum* Gaertn., Kyrenia, July 1935 [573]; Kouklia, Paphos, May 1935 [590].
- This fungus is listed on page 20 of the First List of Cyprus Fungi as *Puccinia ? sclerotioides* Dur. & Mont.
- **tritricina** Erikss., uredo and teleuto, on leaves of *Aegilops ovata* L., Dhiorios, May 1938 [908]. (additional host).
- Uredo prosopidis** Jacz., on leaves of *Prosopis stephaniana* Kunth., Kythrea, August 1937 [865].

Agrees closely with the description of the above, described in 1900 from Kurdamur, Transcaucasia and up to 1924 not otherwise reported. The host of the type is *Prosopis stephaniana* Kunth. (G. R. B.)

- Uromyces polygoni** (Pers.) Fckl., uredo only, on leaves of *Polygonum* sp., Kakopetria, June 1934 [635]; Nicosia, June 1937 [862].

Uredo characters agree particularly in the very finely verrucose markings of the spores. (G. R. B.)

HYMENOMYCETES.

- Ganoderma applanatum** (Pers.) Pat., on collar of *Citrus limonum* Risso, Lapithos, June 1938 [935]. (additional host).
- Polyporus sulphureus** (Bull.) Fr., on trunk of *Ceratonia siliqua* L., Pyrgos, November 1937 [880].

HYPHOMYCETES (and Mycelia Sterilia).

- Cercospora rosicola** Passer, on leaves of *Rosa* sp., Nicosia, December 1937 [885].
 — **tripolitana** Sacc. & Trott., on leaves of *Emex spinosa* (L.) Campd., Famagusta, March 1938 [918].
Rhizoctonia solani Kühn., isolated from stem and root rot of *Dianthus caryophyllus* L., (cult.), Famagusta, November 1937 [938] (additional host).

MELANCONIALES.

- Phleospora dodonaeae** Nattrass, on leaves of *Dodonaea viscosa* L., Famagusta, March 1938 [896].

SPHAEROPSIDALES.

- Ascochyta dianthi** (Alb. & Schw.) Berk. (= *Septoria dianthi* Desm.), on leaves of *Silene venosa* Asch., Lysi, June 1938 [931].
 — **meliloti** (Trel.) J. J. Davis (*Stagonospora meliloti* (Lasch.) Petrak), on leaves of *Melilotus indica* All., Astromeriti, March 1938 [903].
Diplodia natalensis Pole-Evans, on branch of *Citrus nobilis* Lour., Famagusta, June 1938 [936] (additional host).
Macrophomina phaseoli (Maubl.) Ashby, on root and stem of *Uigna sinensis* (L.) Savi, Kythrea, July 1938 [932] (additional host).
Phoma betae Frank, on leaves and petioles of *Beta vulgaris* var. *cicla* L., Dheftera, January 1938 [897].
Septoria urticae Rob. & Desm., on leaves of *Urtica pilulifera* L., Nicosia, March 1938 [898].

HOST INDEX.

- Aegilops ovata** L.
Puccinia triticea Erikks.
Asphodelus fistulosus L.
Puccinia barbeyi (Roum.) Magn.
Avena orientalis Schreb.
Puccinia graminis Pers.
Beta vulgaris var. *cicla* L.
Phoma betae Frank.
Brassica oleracea var. *Botrytis* L.
Rhizopus nigricans Ehrenberg.
Calendula persica C. A. M.
Entyloma calendulae (Oud.) de Bary.
Ceratonia siliqua L.
Polyporus sulphureus (Bull.) Fr.
Chenopodium murale L.
Peronospora effusa (Grev.) de Bary.

- Cirsium syriacum** Gaertn.
Puccinia notobasidis Gonz. Frag.
- Citrus limonum** Risso.
Ganoderma applanatum (Pers.) Pat.
- Citrus nobilis** Lour.
Diplodia natalensis Pole-Evans.
- Clarkia elegans** Doug. (cult.)
Peronospora arthuri Farl.
- Dianthus caryophyllus** L.
Rhizoctonia solani Kuhn.
- Dodonaea viscosa** L.
Phleospora dodonaeae Nattrass.
- Emex spinosa** (L.) Campd.
Cercospora tripolitana Sacc. & Trott.
Peronospora rumicis Corda.
- Euphorbia arguta** Soland.
Melampsora euphorbiae-gerardianae W. Muller.
- Gladiolus segetum** Ker-Gawl.
Urocystis gladioli (Req.) W. G. Smith.
- Hordeum spontaneum** Koch.
Puccinia anomala Rost.
- Lens esculenta** Monch.
Peronospora viciae (Berk.) de Bary.
- Medicago** sp.
Peronospora trifoliorum de Bary.
- Melilotus indica** All.
Ascochyta meliloti (Trel.) J. J. Davis.
- Panicum repens** L.
Sorosporium punctatum Malençon & Yen.
- Polygonum** sp.
Uromyces polygoni (Pers.) Fekl.
- Prosopis stephaniana** Kunth.
Uredo prosopidis Jacz.
- Rosa** sp.
Cercospora rosicola Passer.
- Senecio vulgaris** L.
Bremia tulasnei (Hoffm.) Syd.
- Silene venosa** Asch.
Ascochyta dianthi (Alb. & Schw.) Berk.
- Sisymbrium irio** L.
Peronospora parasitica (Pers.) Fr.

Solanum tuberosum L.*Rosellinia necatrix* (Hart.) Berl.**Urtica pilulifera** L.*Septoria urticae* Rob. & Desm.**Vicia faba** L.*Cunninghamella echinulata* (Thaxter) Thaxter.**Vigna sinensis** (L.) Savi.*Macrophomina phaseoli* (Maubl.) Ashby.

A List of Parasites recorded from the Domestic and Wild Animals and Birds of Cyprus.

Compiled by R. MOYLAN GAMBLES, M.A., B.Sc., M.R.C.V.S., F.R.E.S.

NEMATODES.

<i>Trichuris ovis</i> (= <i>Trichocephalus ovis</i>)	..	..	Goat.
<i>T. trichiura</i>	..	..	Pig.
<i>Capillaria longicollis</i>	..	..	Fowl.
<i>Capillaria</i> sp. al.	..	..	Duck.
<i>Ascaris lumbricoides</i>	..	..	Pig.
<i>Parascaris equorum</i> (= <i>Ascaris megalcephala</i>)	..	..	Horse.
<i>Toxocara canis</i> (= <i>Belascaris marginata</i>)	..	..	Dog.
<i>T. mystax</i> (= <i>Belascaris cati</i>)	..	..	Cat.
<i>Torascaris leonina</i> (= <i>T. limbata</i>)	..	..	Dog.
<i>Ascaridia perspicillum</i> (= <i>A. galli</i> , or <i>Ascaris infensa</i>)	..	..	Fowl.
[<i>Heterakis gallinae</i> (= <i>H. papillosa</i>) probably recorded in error for the next species	..	..	Fowl.]
<i>Subulura brumpti</i>	..	..	Fowl. Duck.
<i>Allodapa sucloria</i>	..	..	Fowl.
<i>Probstmayria vivipara</i>	..	..	Horse. Donkey.
<i>Oxyuris equi</i>	..	..	Horse.
<i>Hystrix tricolor</i>	..	..	Duck.
<i>Strongylus edentatus</i>	..	..	Horse. Donkey.
<i>S. vulgaris</i>	..	..	Horse. Donkey.
<i>S. equinus</i>	..	..	Horse.
<i>Triodontophorus serratus</i>	..	..	Horse.
<i>Trichonema catinatum</i> (= <i>Glycostomum catinatum</i>)	..	..	Horse (and donkey ?).
<i>Oesophagostomum dentatum</i>	..	..	Pig.
<i>Oe. venulosum</i>	..	..	Sheep. Goat.
<i>Chabertia ovina</i>	..	..	Sheep. Goat.
<i>Uncinaria stenocephala</i>	..	..	Dog.
<i>Haemonchus contortus</i>	..	..	Sheep. Goat.
<i>Ostertagia circumcincta</i>	..	..	Sheep. Goat.
(<i>O. ostertagi</i> , probably recorded in error for the previous, or else the next species	..	..	Goat.)
<i>O. marshalli</i>	..	..	Sheep.
<i>O. trifurcata</i>	..	..	Sheep. Goat.

* Identification not yet confirmed.

<i>Trichostrongylus axei</i>	..	..	..	..	..	Sheep. Goat.
<i>T. vitrinus</i>	..	..	..	..	..	Sheep. Goat.
<i>T. colubriformis</i>	..	..	..	..	..	Sheep.
<i>T. capricola</i>	..	..	..	..	..	Sheep.
<i>Nematodirus</i> sp.	..	..	..	..	..	Sheep. Goat.
<i>Metastrongylus apri</i>	..	..	..	..	..	Pig.
<i>Choerostrongylus pudendotectus</i>	..	..	..	..	..	? (presumably pig).
<i>Dictyocaulus filaria</i>	..	..	..	..	..	Sheep. Goat.
[<i>Muellerius capillaris</i> (" <i>Filaria capillaris</i> ,") a very old and doubtful record, more likely to refer either to the previous species or to the next Goat.]						
<i>Protostrongylus ocreatus</i>	..	..	..	..	..	Sheep. Goat.
[<i>P. rufescens</i> . (probably recorded in error for the previous species) Sheep.]						
<i>Aelurostrongylus abstrusus</i> (= <i>Synthetostongylus pusillus</i>)	..	..	..	..	..	Cat.
<i>Habronema megastoma</i>	..	..	..	..	..	Horse. Donkey.
<i>H. microstoma</i>	..	..	..	..	..	Horse.
<i>H. muscae</i>	..	..	..	..	..	Horse. Donkey.
<i>Gongylonema pulchrum</i>	..	..	..	..	..	{ Ox. Sheep. Goat. Horse. Camel.
<i>G. verrucosum</i>	..	..	..	..	..	Goat.
<i>Thelazia rhodesi</i> (= <i>Filaria oculi</i>)	..	..	..	..	..	Ox.
<i>Spirocerca sanguinolenta</i> (= <i>Spiroptera sanguinolenta</i>)	..	..	..	..	..	Dog.
<i>Rictularia cahirensis</i>	..	..	..	..	..	Cat.
<i>Rictularia</i> sp.	..	..	..	..	..	Fox.
<i>Setaria equina</i>	..	..	..	..	..	Horse.

ACANTHOCEPHALA.

<i>Prosthenorchis erinacei</i>	..	..	..	..	..	Hedgehog.
<i>P. pachyacanthus</i> (= <i>Macrocanthorhyncus catulinus</i>)	..	..	..	..	..	Dog. Cat.
do. (larvae)	..	..	..	..	..	Snake.

TREMATODES.

<i>Fasciola hepatica</i>	..	..	..	..	..	Sheep.
<i>Heterophyes heterophyes</i>	..	..	..	..	..	Dog.
<i>Catantropis verrucosa</i>	..	..	..	..	..	Duck.

CESTODES.

<i>Mesocestoides lineatus</i>	..	..	..	..	..	Dog. Cat. Fox.
<i>Tetrathyridium bailleti</i> (= <i>Dithyridium elongatum</i>)	..	..	..	..	..	Cat. Fox. Dog. Fowl.
<i>Moniezia expansa</i>	..	..	..	..	..	Kid.
<i>M. benedeni</i> (= <i>M. planissima</i>)	..	..	..	..	..	Lamb.
<i>Avitellina centripunctata</i>	..	..	..	..	..	Sheep. Goat.
<i>Stilesia globipunctata</i>	..	..	..	..	..	Sheep. Goat.
<i>Taenia teniaeformis</i> (= <i>T. crassicolis</i>)	..	..	..	..	..	Cat.
<i>Cysticercus fasciolaris</i>	..	..	..	..	..	Rat.
<i>Taenia hydatigena</i> (= <i>T. marginata</i>)	..	..	..	..	..	Dog.
<i>Cysticercus tenuicollis</i>	..	..	..	..	..	Sheep. Goat.

<i>Tænia pisiformis</i> (= <i>T. serrata</i>)	..	..	..	Dog.
<i>Cysticercus pisiformis</i>	..	..	..	Hare. Rabbit.
<i>Tænia ovis</i>	..	..	..	Dog.
<i>Cysticercus ovis</i>	..	..	..	Sheep.
<i>Cysticercus cellulosæ</i>	..	..	..	Pig.
<i>Cysticercus bovis</i>	..	..	..	Ox.
<i>Echinococcus granulosus</i> (adult)	..	..	..	Dog.
<i>Echinococcus granulosus</i> (cyst)	..	..	..	Sheep. Goat.
				Ox. Pig.
<i>Dipylidium caninum</i>	..	..	..	Dog. Cat.
<i>Joyeuxia pasqualei</i> (= <i>J. chyzeri</i>)	..	..	..	Cat.
<i>Diplopylidium nolleri</i>	..	..	..	Cat.
<i>D. acanthotetra</i>	..	..	..	Cat.
<i>Cysticercus acanthotetra</i>	..	..	..	Snake.
<i>Davænia spiralis</i>	..	..	..	Pigeon.
<i>Raillietina tetragona</i>	..	..	..	Fowl.
<i>R. echinobothrida</i>	..	..	..	Fowl.
<i>R. cesticillus</i>	..	..	..	Fowl.
<i>R. micracantha</i>	..	..	..	Pigeon.
<i>Choanotænia infundibulum</i>	..	..	..	Fowl.
<i>Weinlandia</i> sp. (= <i>Hymenolepis</i>)	..	..	..	Duck.

TICKS AND MITES.

<i>Argas persicus</i>	..	..	..	Fowl.
<i>Ixodes ricinus</i>	..	..	..	Goat.
<i>Hæmaphysalis cinnabarina</i> , var. <i>punctata</i>	..	..	..	Sheep. Goat. Ox.
<i>Rhipicephalus bursa</i>	..	..	..	Sheep. Goat.
* <i>Rh. sanguineus</i>	..	..	..	Dog. Cat.
<i>Hyaloma ægyptium</i>	..	..	..	Sheep. Goat.
				Ox. Horse.
<i>Hyaloma ægyptium</i> (nymph)	..	..	..	Dog. Fowl.
				Hare.
<i>Notoedres cati</i>	..	..	..	Cat.
<i>Cnemidocoptes mutans</i>	..	..	..	Fowl.
<i>Psoroptes cuniculi</i>	..	..	..	Rabbit.
<i>Otodectes felis</i>	..	..	..	Cat.
<i>Demodex canis</i>	..	..	..	Dog.
<i>D. caprae</i>	..	..	..	Goat.

PENTASTOMES.

<i>Linguatula rhinaria</i> (larvæ)	..	..	..	Sheep. Goat.
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LICE.

<i>Hæmatopinus asini</i>	..	..	..	Donkey.
<i>H. suis</i>	..	..	..	Pig.
<i>H. eurysternus</i>	..	..	..	Ox.
<i>Solenopotes capillatus</i>	..	..	..	Ox.
<i>Linognathus stenopsis</i>	..	..	..	Goat.
<i>L. piliferus</i>	..	..	..	Dog.
<i>Bovicola bovis</i> (= <i>Trichodectes scalaris</i>)	..	..	..	Ox.

* Identification not yet confirmed.

<i>B. ovis</i> (= <i>T. spherocephalus</i>)	..	..	..	..	..	Sheep.
<i>B. limbata</i> (= <i>T. hermsi</i>)	..	..	..	..	..	Goat.
<i>B. equi</i> (= <i>T. parumpilosus</i>)	..	..	..	..	..	Donkey.
<i>Trichodectes canis</i> (= <i>T. latus</i>)	..	..	..	..	..	Dog.
<i>Felicola subrostrata</i> (= <i>T. subrostratus</i>)	..	..	..	..	..	Cat.
<i>Gyropus ovalis</i>	..	..	..	..	..	Guinea pig.
<i>Gliricola porcelli</i>	..	..	..	..	..	Guinea pig.
<i>Eomenacanthus stramineus</i>	..	..	..	..	..	Fowl. Turkey.
<i>Menopon</i> sp.	..	..	..	..	..	Fowl.
<i>Lipeurus</i> sp.	..	..	..	..	..	Fowl.
<i>Goniocotes</i> sp.	..	..	..	..	..	Fowl.
<i>Columbicola columbae</i> (<i>Esthiopterum columbae</i>)	..	..	..	..	..	Pigeon.
<i>Colpocephalum turbinatum</i>	..	..	..	..	..	Pigeon.
<i>Degeeriella fusca</i> s.l.	..	..	..	..	..	Marsh Harrier.
<i>Philopterus</i> sp.	..	..	..	..	..	Marsh Harrier.

FLEAS.

<i>Otenocephalides canis</i>	..	..	..	..	..	Dog.	Fox.
<i>Ot. felis</i>	..	..	..	..	..	Fox.	Rabbit.

OESTRIDÆ.

<i>Gastrophilus intestinalis</i> (= <i>G. equi</i>)	..	..	..	Horse. Mule. Donkey.
<i>G. veterinus</i> (= <i>G. nasalis</i>)	..	..	..	Horse. Donkey.
<i>Hypoderma lineatum</i>	..	..	..	Ox.
<i>H. bovis</i>	..	..	..	Ox.
<i>H. ceratum</i>	..	..	..	Goat. Sheep.
<i>Cephalomyia ovis</i> (<i>Oestrus ovis</i>)	..	..	..	Sheep. Goat.

HIPPOBOSCIDÆ.

<i>Hippobosca equina</i>	..	..	..	..	..	Horse. Ox.
<i>H. longipennis</i> (= <i>H. capensis</i>)			..	..	..	Dog.
<i>Lipoptena caprina</i>	..	..	..	..	..	Goat.
<i>Melophagus ovinus</i>	..	..	..	..	..	Sheep.

PROTOZOA.

<i>Borrelia gallinarum</i> (<i>Spirochaeta gallinarum</i>)..	..	Fowl.	Turkey
		Pigeon.	Duck
<i>Leishmania donovani</i>	..	Dog.	
<i>Babesia</i> sp.	..	Goat.	
<i>Eimeria tenella</i>	..	Fowl.	
<i>E. stiedæ</i>	..	Rabbit.	
<i>Sarcocystis</i> sp.	..	Goat.	

Government Stock Farm, Notes.

THE three Dairy Shorthorn heifers imported from England in October have now calved and are milking well, averaging, two months after calving, over 3 gallons per day each.

The recent wet weather has had the effect of reducing the milk yields of sheep at Athalassa and probably elsewhere: average daily yields of 800 kg. or 300 drams per ewe were obtained during fine weather.

The demand for pigs has been very keen lately but the demand is mostly for fattening pigs and cannot be met as only the poorer piglings are sold for fattening, all others as far as possible being sold or issued on loan to *bona fide* breeders.

Hatching of chickens has progressed favourably since November and nearly 1,500 have now been hatched compared with 1,000 a year ago, but fertility has not been as good as expected.

The data obtained in 1938 at the Government Stock Farm on milk yields, etc., is given below as it may be of general interest—figures of milk yields are given in lb. and in okes.

SUMMARY OF DATA OBTAINED IN 1938 AT THE GOVERNMENT STOCK FARM.

	<i>lb.</i>	<i>okes</i>
1. <i>Cattle</i> :		
Average milk yield (of 16 cows)	8,860	3,136
Highest yield per cow (in 350 days) ..	13,350	4,770
2. <i>Sheep</i> :		
Average yield of 60 ewes (30 in 1937) ..	156	56
Average milking period, excluding suckling ..	137 days	
Average daily yield	1.14	163 dr.
Highest lactation yield	335	120
3. <i>Goats</i> :		
Average yield of 16 Maltese goats	510	183
Average yield of 10 Native goats	264	94
Highest yield of Maltese (= approx. 1½ okes per day). (See also experiment described in <i>Cyprus Agri- cultural Journal</i> , December, 1938) ..	1,010	360
4. <i>Pigs</i> :	No.	
Average number of pigs born per litter ..	9.5	
Average number of pigs weaned per litter ..	8.8	
Approximate weight at weaning	21	7.5
5. <i>Poultry</i> :		
Average egg production (Rhode Island Red)		156
Number of eggs sold for hatching		3,505
Number of chicks hatched		1,888
Number of eggs set per chick reared		2.35
Number of chickens and cockerels sold (<i>round figure</i>). ..		900

Sericultural Notes.

SILKWORM EGGS.

THE total quantity of silkworm eggs available for rearing in the 1930 sericultural season is 5,877 ounces, of which 4,885 ounces were produced locally and 992 ounces were imported.

The quantity of eggs used in the 1938 season was 4,912 ounces.

All the silkworm eggs were as usual hibernated at Pedhoulas, where suitable accommodation was secured by the Agricultural Department, and the eggs were removed for disposal on 20th February.

SERICULTURAL STATION, KALOPANAYIOTIS.

Rearings of silkworms of 12 different races and crosses were carried out in the Sericultural Station, Kalopanayiotis, in 1938, and a total of 127 ounces (1,016 drams) of eggs was produced and is available for sale this sericultural season to silkworm egg producers for reproduction and the improvement of their own races, and to other rearers. The price of these eggs is $4\frac{1}{2}p.$ per dram (4s. per ounce).

About 120 drams of these silkworm eggs will be issued free of charge to Girls' Schools for demonstrational silkworm rearings.

SERICULTURAL TRIAL AT LAPITHOS.

An experimental rearing of silkworms from eggs obtained from various sources is being carried out by the Agricultural Department this season at Lapithos. Lapithos produces more silk than any other place in Cyprus and for this reason has been selected for this trial, which will be similar to that carried out at Kalopanayiotis in 1935 and described in this *Journal* for December, 1935. The considerable difference between the climatic conditions of Kalopanayiotis and Lapithos makes the repetition of this trial very desirable, but it has not been possible to arrange it previously.

SILKWORM REARING IN GIRLS' SCHOOLS.

The Agricultural Department, with the co-operation of the Education Department, has arranged for demonstrational silkworm rearings to be carried out this season in 119 Girls' Schools (109 Orthodox-Christian and 10 Moslem). The silkworm eggs required (one dram to each school) will be supplied by the Agricultural Department free of charge.

The rearings will be carried out by the girls of the three upper classes under the supervision of the Schoolmistress and will be visited by the Sericultural and Agricultural Officers of the Agricultural Department, who will give any instructions required. Prizes will be awarded to Schoolmistresses on the same lines as in previous years.

LIST OF SILKWORM EGG PRODUCERS LICENCED FOR THE YEAR 1939-40.

<i>Name</i>	<i>Village</i>
1. Ioannis Karamichalis	Kalopanayiotis
2. Nicolas Chr. Taliadoros & Son	"
3. Savvas G. Katalanos	"
4. Sofoclis K. Michaelides	"
5. Charalambos Leptos	Moutoullas
6. Miltiades K. Ioannides	"
7. Miltiades Charalambides	"
8. Socratis I. Michaelides	"
9. Loizos M. Koullouros	Pedhoulas
10. Socratis Karamichalis	"
11. Sergios S. Pavlou	Nikos
12. Xenis I. Xenides	Kondea
13. Theodhora Eliadou	Famagusta
14. Ioannis Papaloizou	Galata
15. Anthimos Eliades.. .. .	Alona
16. Cleanthis Christodoulides	"
17. George A. Englezakis	Mesoyi
18. Nicolas Economou	Kissonerga
19. Anna G. Karapataki	Akaki
20. Gavriel Karapatakis	"

Meteorological Data, Cyprus.

SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS.
DECEMBER, 1938.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	63.00	45.35	4.62	17	1.57	2.61	—
Athalassa	—	—	4.17	9	1.78	2.50	—
Morphou	63.96	44.25	2.99	16	0.77	2.16	—
Makhaeras	—	—	6.62	8	2.20	4.70	—
<i>Famagusta District :</i>							
Famagusta	66.09	49.00	5.90	11	1.60	3.57	—
Akhyritou	64.13	44.13	6.31	9	1.85	2.97	—
Rizokarpaso	—	—	8.95	14	1.85	5.05	—
Lefkoniko	—	—	4.81	12	1.80	3.17	—
<i>Larnaca District :</i>							
Larnaca	66.51	46.45	4.72	9	1.60	4.96	—
Lefkara	—	—	7.39	12	2.55	5.25	—
<i>Limassol District :</i>							
Limassol	65.81	49.68	6.49	16	1.71	3.80	—
Saittas	—	—	7.24	13	1.80	4.52	—
Trikoukkia	48.10	34.53	9.72	13	2.65	6.48	30.31
Alektora	—	—	4.88	11	1.30	4.69	—
<i>Paphos District :</i>							
Paphos	57.68	52.32	3.97	16	0.70	3.50	—
Polis... ..	—	—	6.68	15	1.80	3.56	—
<i>Kyrenia District :</i>							
Kyrenia	64.06	52.19	9.69	18	4.28	5.24	—

Note.—Compiled from returns furnished by Public Works Department.

JANUARY, 1939.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	60.29	42.87	3.10	11	0.89	3.71	—
Athalassa	—	—	2.74	6	0.78	3.36	—
Morphou	65.42	43.96	2.01	11	0.78	3.18	—
Makhaeras	—	—	8.75	6	3.42	6.54	—
<i>Famagusta District :</i>							
Famagusta	63.54	48.00	5.48	14	1.41	4.90	—
Akhyritou	61.61	41.32	4.60	11	1.55	3.52	—
Rizokarpaso	—	—	3.59	8	0.80	6.11	—
Lefkoniko	—	—	3.77	7	1.00	3.06	—
<i>Larnaca District :</i>							
Larnaca	60.68	41.58	6.93	9	3.70	5.62	—
Lefkara	—	—	9.07	13	1.77	5.73	—
<i>Limassol District :</i>							
Limassol	62.74	45.74	5.87	12	1.70	4.75	—
Saittas	—	—	6.69	11	2.55	6.65	—
Trikoukkia... ..	44.57	31.74	8.47	11	2.45	9.07	1.23, 24
Alekhtora	—	—	6.34	12	1.40	5.32	—
<i>Paphos District :</i>							
Paphos	53.10	48.40	5.86	12	2.25	3.29	—
Polis... ..	—	—	4.20	10	1.65	3.57	—
<i>Kyrenia District :</i>							
Kyrenia	61.16	48.23	4.65	13	1.40	3.54	—

FEBRUARY, 1939.

<i>Nicosia District :</i>							
Nicosia	59.61	41.32	3.48	12	1.26	2.25	—
Athalassa	—	—	3.26	10	1.25	1.98	—
Morphou, C.E.F.	60.10	42.75	2.55	10	0.75	2.36	—
Makhaeras	—	—	8.18	5	2.80	4.16	—
<i>Famagusta District :</i>							
Famagusta	63.00	42.57	2.57	8	0.82	2.65	—
Akhyritou	59.82	39.18	2.51	7	0.68	1.90	—
Rizokarpaso	—	—	2.01	6	0.65	3.28	—
Lefkoniko	—	—	1.87	5	0.80	2.22	—
<i>Larnaca District :</i>							
Larnaca	60.07	42.00	2.80	7	1.10	2.82	—
Lefkara	—	—	5.66	9	1.40	3.32	—
<i>Limassol District :</i>							
Limassol	62.14	44.04	4.34	11	1.33	2.74	—
Saittas	—	—	5.83	11	1.25	4.62	—
Trikoukkia	44.75	30.45	6.95	10	2.10	6.61	2.15, 12
Alekhtora	—	—	4.20	8	1.13	3.64	17 & 23
<i>Paphos District :</i>							
Paphos	52.89	46.00	5.73	10	2.18	3.22	—
Polis	—	—	2.30	6	0.65	2.80	—
<i>Kyrenia District :</i>							
Kyrenia	60.25	47.29	4.24	12	1.42	4.42	—

Note.—Compiled from returns furnished by Public Works Department.

Agricultural Department Publications.

THE following bulletins and leaflets have been published in English, Greek or Turkish as indicated by the letters *E.*, *G.* or *T.* after each title.

BULLETINS.

Industrial Series :

No. 1.—“The Grape and Wine Industry of Cyprus.” By M. T. Dawe, O.B.E., F.L.S. *E.*

No. 2.—“The Tanning Industry.” By M. T. Dawe, O.B.E. F.L.S. *E.*

Horticultural Series :

No. 1.—“Some Observations on the Citrus Industry of Palestine, with reference to Application of Improved Methods to the Citrus Industry of Cyprus.” By B. J. Weston, M.A., M.Sc., F.R.H.S. *E.*

No. 2.—“Picking, Grading and Packing of Citrus Fruits. A Guide for Exporters.” By B. J. Weston, M.A., M.Sc. (Agr.) *E., G. & T.*

The above two series are now combined and the following have been published :—

No. 3.—“Report on Soil Erosion in Cyprus.” By A. Pitcairn. *E., G. & T.*

No. 4.—“Summary of Agricultural Legislation in Cyprus.” *E.*

Entomological Series :

No. 1.—“Investigations into the Locust Plague in Cyprus.” By Ch. G. Pelagias, I.A. (Gx.), F.A.I. (Gx.), (also *Corrigendum*). *E.*

No. 2.—“A Survey of Olive Pests.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.* (*T.* out of print).

No. 3.—“Insect Pests and Fungus Diseases of Cyprus and their Control.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.*

No. 4.—“Injurious Insects of Cyprus.” By H. M. Morris, M.Sc., F.R.E.S. *E.*

Mycological Series :

No. 1.—“The Control of Fungus Diseases.” By R. M. Nattrass, B.Sc., Ph.D., D.I.C. *E., G. & T.* (*G.* out of print.)

“A first List of Cyprus Fungi.” By R. M. Nattrass, B. Sc., Ph.D., D.I.C. *E.*

LEAFLETS.

No. 1.—“Petroleum Emulsion.” *G.* (Out of print.)

No. 2.—“Boll Worms of Cotton.” *G.*

No. 3.—“Collection, Sorting and Packing of Oranges.” *G.* (Out of print.)

No. 4.—“The Cultivation of the Orange Tree.” *G.*

No. 5.—“Carpocapsa” *G.* (Replaced by No. 22.)

- No. 6.—“General Rules for Silkworm Rearing.” *E. G. & T.*
(Reprinted, see also No. 8, Educational Series).
- No. 7.—“Cultivation of Almond Trees.” *G.* (Out of print.)
- No. 8.—“Soil Manuring.” *G.* (Out of print.)
- No. 9.—“Control Measures for Red Scale of Citrus.” *G.* (Out of print.)
- No. 10.—“Seed Beds.” *G.* (Out of print.)
- No. 11.—“The Collection of Sumach.” *G.*
- No. 12.—“The Almond Pest (*Eurytoma amygdali*, End.)” *E., G. & T.*
(Out of print.)
- No. 13.—“Outline of the Rat Destruction Campaign for 1930.”
E., G. & T. (Out of print.)
- No. 14.—“Potato Tuber Moth.” *E., G. & T.* (Out of print; replaced
By No. 17).
- No. 15.—“Warble Flies.” *E., G. & T.* (*E.* out of print.)
- No. 16.—“Downy Mildew of the Vine (*Plasmopara viticola*).” *E., G. & T.*
- No. 17.—“Potato Tuber Moth.” *E., G. & T.* (Replaces No. 14.)
- No. 18.—“The White Rot of Onions in Cyprus.” *E., G. & T.*
- No. 19.—“The Production of Silage.” *E., G. & T.* (Out of print;
see No. 7 Educational Series.)
- No. 20.—“Importation of Plants, Fruit, etc., into Cyprus.” *E.*
(Reprinted and brought up to date.)
- No. 21.—“*Ceratitis capitata*, Wied. Mediterranean Fruit Fly.”
E., G. & T.
- No. 22.—“Pests of the Apple Tree.” *E., G. & T.* (Replaces No. 5.)
- No. 23.—“Citrus Wastage.” *E., G. & T.*
- No. 24.—“Pests of Citrus Trees and Fruit.” *E., G. & T.*
- No. 25.—“The Ox-Warble Fly.” *E., G. & T.*

Educational Series :

- No. 1.—“Agricultural Resources of Cyprus.” *E., G. & T.*
- No. 2.—“Breeding, Feeding & Management of Cattle.” *E., G. & T.*
- No. 3.—“Agricultural Calendar.” *E., G. & T.*
- No. 4.—“Linseed (*Linum usitatissimum*).” *E., G. & T.*
- No. 5.—“Sesame (*Sesamum indicum*).” *E., G. & T.*
- No. 6.—“Production of Olives and Olive Oil.” *E., G. & T.*
- No. 7.—“Production of Silage.” *E., G. & T.*
- No. 8.—“Sericulture.” *E., G. & T.*
- No. 9.—“Citrus Fruit Growing in Cyprus.” *E., G. & T.*
- No. 10.—“The Breeding and Management of Sheep in Cyprus.”
E., G. & T.
- No. 11.—“Flax.” *E., G. & T.*
- No. 12.—“Diseases of Poultry.” *E., G. & T.*
- No. 13.—“Irrigation in Cyprus.” *E., G. & T.*
- No. 14.—“Cereal Crops.” *E., G. & T.*
- No. 15.—“Diseases of Sheep and Goats.” *E., G. & T.*
- No. 16.—“The Cultivation of the Carob Tree in Cyprus.” *E., G. & T.*
- No. 17.—“Table Grapes & Raisins.” *E., G. & T.*
- No. 18.—“Diseases of Cattle with Special Reference to Cyprus.” *E.*

EDITORIAL AND ADVERTISEMENT NOTICES

All communications for publication should be addressed to the Editor, *Cyprus Agricultural Journal*, Department of Agriculture Nicosia.

Contributions are invited, written on one side of the paper only. It should be understood that unaccepted manuscripts can not be returned unless postage is prepaid.

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Annual subscription payable in advance 16p. post free. Overseas subscription 18p. (2/-).

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The "*Cyprus Agricultural Journal*" is published in March, June September and December.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

The Horse Breeding Law, 1930.

LIST OF STALLIONS LICENSED FOR 1939.

NICOSIA DISTRICT.			
<i>Village</i>		<i>Owner's name</i>	<i>Reg. No.</i>
Akaki	..	Michael Th. Rafti	29
"	..	Moisis Michael Tchingi	203
Argaki	..	Polyvios Theophani	153
Astromeritis	..	Christoforos Evangelis	26
Kalokhorio	..	Yioryis Papaconstantinou	262
Lefka	..	Ahmet Dopran Salih	255
Louroujina	..	Arif Mustafa Papyro	66
Lymbia	..	Andronikos Petri	32
Mammari	..	N. Haji Haralambou	292
Morphou	..	Vasilis T. Spanos	18
do.	..	Andreas Ahapittas	249
Pera Khorio	..	Tofis Michael	294
Yeri	..	Yeoryos Petri	16
Yerolakkos	..	Haji Michael Haji Loi	35
LARNACA DISTRICT.			
Alaminos	..	Rifat Jumaa	260
do.	..	Salih Jumaa	64
Aradhippou	..	Costis Kyriakou	15
do.	..	Lefteris Towli	225
Athienou	..	Costas N. Haji Vrashimi	96
do.	..	Vasilis M. Phiakou	159
do.	..	Nicolas Vassili Phiakou	276
Larnaca	..	Ipermachos Kyriakou Petroladhas	288
Voroklini	..	Panayis Theodosi	106
FAMAGUSTA DISTRICT.			
Akanthou	..	Yiannis Hambi	270
Asha	..	Antonis Michael	92
do.	..	Christos Haji Lavithi	234
do.	..	Kyriakos Antoni	239
do.	..	Apostolou Hj. Zannetou	274
do.	..	Eleni Demetri Kounalli	208
Ayios Andronikos	..	Spyros Yeoryi	65
do.	..	Christofis Hambi	240
Ayios Elias	..	Constantis Stylli	246
do.	..	Yeorgios Christodoulou	265
Ayios Seryios	..	Nicolas Yeoryi	219
Chatos	..	Ahmet Koja Ibrahim	285
Ephtakomi	..	Kyriakos G. Xydonta	298
do.	..	Antonis Andrea	299
Galatia	..	Akil Mustafa Gonie	54
Kalopsidha	..	Yeoryios Antoniou	267
Komi Kebir	..	Kyriakos Constanti	68
Kondea	..	Christos Hanni	259
Lefkoniko	..	Mehmed Salih	38
do.	..	Panayis Petrou Chira	206
Leonariso	..	Chrysanthos Panayi	56

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Lysi	..	Minas Lysandrou	..	80
do.	..	Demetris Tophia	..	227
do.	..	Yangos M. Katsouris	..	301
Melanagra	..	Kallis Kyriakou	..	60
Milea	..	Sotira Panayi	..	284
do.	..	Panayis Loizi Haji Rousou	..	296
Ovgoros	..	Djafer Emin A. M. Mustafa	..	213
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do.	..	Christofis N. Koulia	..	241
do.	..	Pandelis N. Haji Hari	..	281
do.	..	Anna Pavlou Matheou	..	300
Sotira	..	Vasilis Demetri	..	252
Styllos	..	Annezou Nikou	..	269
Trikomo	..	Marikou Kyriakou	..	224
do.	..	Kyprianos Stylli Haili	..	266
do.	..	Patroclos Kyriakou	..	297
Vatili	..	Andreas G. Iona	..	86
do.	..	Vasiliki Haji Christodoulou	..	89
Yialousa	..	Christofis Panayi Pitchi	..	280
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Anoyira	..	Thoukis Solomi	..	143
Asgata	..	Demosth. Evangelis	..	295
Av. Phyla	..	Costis P. Silikiotis	..	118
Limassol	..	Mehmed Mustafa	..	40
Pakhna	..	Theodoros Evgeniou	..	121
do.	..	Haralambos M. Kais	..	283
Phasoula	..	Nicolas Evangelis	..	272
PAPHOS DISTRICT.				
Dhrousa	..	Yiannis Sava	..	139
Khoulou	..	Ahmet Kiazim	..	289
Kissonerga	..	Evangelis Haji Nicola	..	126
do.	..	Haji Towlis Haralambou	..	129
Kouklia	..	Mehmed Hassan Kokkinos	..	215
Ktima	..	Veli Tselebis	..	127
„	..	Ali Arif Kallikas	..	290
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Lapithiou	..	Mehmed Mulla Osman	..	263
Lasa	..	Yeoryios Ch. Ellinas	..	130
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do.	..	Chrysost. Panayiotou	..	214
Peristerona	..	Solomon Haralambou	..	230
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Stroumbi	..	Sofoklis Constanti	..	178
Tala	..	Costis Papa Daniel	..	286

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
KYRENIA DISTRICT.				
Agri dhaki	..	Haralambos Yianni	..	147
Asomatos	..	Christallou Michaeli	..	146
do.	..	Antonis Haji I. Hanni	..	150
Ayios Ermolaos	..	Efstathios Christofi	..	166
Ayios Yeoryios	..	Costis Nicola Spanou	..	157
Kato Dhikomo	..	Savas K. Demetriades	..	236
Dhiorios	..	Gregoris Haji Michael	.	148
Dhikomo, Kato	..	Loukas G. Loukaides	..	273
Kyrenia	..	Shakir Hussein	.	158
Lapithos	..	Polyk. Panayioti	..	99
Larnaka tis Lapithou		Miltiades Constanti	..	152
do.	..	Kleanthis Stylianou	..	287
Myrtou	..	Cleov. Stylianou	..	149
Sisklipos	..	Lavithis Demetriou	.	232

1st March, 1939.

ROBERT J. ROE,
*Chief Veterinary Officer,
 Inspector of Horse Breeding.*

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Livestock Officer, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Officer in charge of the Farm.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, including the Nursery Garden, Nicosia, and Officers are stationed at Kythrea, Dheftera, Morphou and Lefka.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA AND LIMASSOL DISTRICTS.

Agricultural Officer, Mr. M. Papaiaiovou, is in charge including Larnaca Nursery Garden. Officers are stationed at Larnaca, Skarinou, Nisou, Agros and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Alonaris, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klokkaris, is in charge. Paphos District includes Paphos and Polis Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelo-kedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant.

FOREST DEPARTMENT OF CYPRUS

Headquarters.—NICOSIA.

FOREST DIVISIONS :—

1. Northern Range Division, with Headquarters at Halefka.
2. Troödos Division, with Headquarters at Platania.
3. Paphos Division, with Headquarters at Stavros.

NORTHERN RANGE DIVISION :

Main Forests : Ayia Irini, Dhiorios, Kormakiti, Korphi, Kornos, Lapithos-Karavas, Karini, Kyrenia Road Block, Bellapais-Dhikomo, Buffavento, Macheroti, Plataniotissa east and west, Pentadactylos, Kartaldagh, Trakhoni, Ambelia, Pernarotos, Boro or Khamilon, Pittaroula, Melandryna, Mavro Oros, Melounda, Kantara, Dennarka, Yiouti, Aetopetra, Sheromilia, N.W. of Peristeria, Akrades, Kavallis, Karpas, Eleousa, Halasta, Apostolos Andreas forests, Salamis Kolymbos, Ambelia and Fresh Water Lake plantations.

Enquiries concerning forest matters, sale of standing trees, plants, etc., should be addressed to the Assistant Conservator of Forests, Northern Range Division, Halefka Forest Station, *via* Kythrea.

TROODOS DIVISION :

Main Forests : Troödos and outlying blocks, Adelphi and outlying blocks, Limassol and outlying blocks, Makheras, Aetomoutti, Stavrovouni, Akrotiri, Limassol plantations and Korno Plantation.

Enquiries concerning forest matters, sale of standing trees, plants, etc., should be addressed to the Assistant Conservator of Forests, Troödos Division, Platania Forest Station.

PAPHOS DIVISION :

Main Forests : Paphos, Akamas.

Enquiries concerning forest matters, sale of standing trees, plants, etc., should be addressed to the Assistant Conservator of Forests, Paphos Division, Stavros tis Psokas Forest Station.

AREAS UNDER THE DIRECT CHARGE OF THE CONSERVATOR OF FORESTS :

The Government House and Athalassa plantations, Nicosia.

Enquiries concerning forest matters, sale of standing trees, plants, etc., should be addressed to the Conservator of Forests, Nicosia,

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Headquarters of the Central Experimental Farm, Morphon.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW

OF THE

AGRICULTURE, FORESTRY AND TRADE OF CYPRUS

Vol. XXXIV, Part 2

JUNE, 1939.

Price 3p.

EDITORIAL NOTES.

CROP PROSPECTS.

WHEAT and barley production is well above the average but some damage occurred to the crop during the heavy rains which fell in many parts of the Island in early June. The June rains have adversely affected the stubble grazings and this may cause a shortage of grazing later in the season.

The greatest damage to cereals was caused to grain on the threshing-floors but if adequate steps are taken to dry the sheaves lying in the fields or soaked in stacks the total loss may not be so great as at first anticipated.

An average production of carobs is expected and the condition of olive trees at blossoming was good.

* * * * *

WHEAT STANDING CROP COMPETITIONS.

Wheat standing crop competitions were held during May, 1939, in Kyrenia District and in the villages of Lefkoniko, Vatili, Prastio, (Famagusta District), Athienou and Kiti (Larnaca District). A competition announced for Ayios Theodoros (Famagusta District) was cancelled owing to lack of entries.

The Kyrenia District competition, known as the "Severis Competition," was held for the third consecutive year. Entries were less good than in 1938, but the winning field, entered by Mr. Antonis Yiannaki of Kormakiti, was very fair. The crop was high-yielding, clean and even and was grown from "Kyperounda" seed purchased from the Central Experimental Farm.

Almost all entries at Lefkoniko were good and it was difficult to choose the best. For the second year Mr. M. A. Papakyriakou carried off first prize with an excellent crop of "Kyperounda." At Prastio the fields were not exceptionally good, but showed a marked improvement over last year. The winner, Mrs. Katelou G. Tappa, raised her crop from "Kyperounda" seed purchased from Lefkoniko. At Vatili, although cultivations had been well carried out, the seed sown was in the majority of cases very mixed. The first prize was awarded to Mr. Theophilos Antoni for a good crop of "Paphitiko."

In Larnaca District, entries were numerous and the competition aroused great interest. At Athienou the fields were well up to the high standard expected at this village and the first prize went to Mr. G. K. Kepolas for a first class field of "Psathas." At Kiti the entries were also good and a field of "Kyperounda," entered by Mr. Ch. G. Hini, was awarded first prize.

On the whole these competitions appear to be gaining their object in arousing a keener desire for growing better crops of wheat. Once again the need for better seed must be emphasized.

* * * * *

AGRICULTURAL SHOWS.

In this issue a notice is published stating that the Department of Agriculture is co-operating with the Village Authorities and the Agricultural Club of Lysi in the organization of the Annual Agricultural Show to be held on the 8th September, 1939. The Department of Agriculture is giving special assistance this year to the Lysi Show and the Paphos District Agricultural Show, and a Central Show Committee has been appointed to co-operate with the local authorities.

The Agricultural, Medical and Forestry Departments are staging special exhibits at these shows and the Committee are planning the showgrounds and preparing special equipment for showrings, animal assembly grounds and enclosures for animals.

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VETERINARY NOTES.

Over 290,000 sheep and goats were vaccinated against Anthrax by the veterinary service during the month of May.

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STUDY LEAVE.

Mr. M. Papaïacovou, Agricultural Officer, Larnaca, who is visiting the United States of America on leave, has been granted an additional three months' study leave to be spent in California. Mr. Papaïacovou will visit the various research centres of the Agricultural Experiment Station of the University of California where he will make a special study of problems connected with the citrus industry, olive and vine cultivation, irrigation systems and soil conservation.

* * * * *

CHANGE OF TITLE.

The title of the post of Manager of the Stock Farm has been changed to that of Livestock Officer. Mr. Maule, the holder of the post concerned, is in charge of the organization and supervision of all the animal husbandry services in Cyprus and the new title more correctly describes his duties.

* * * * *

ANNUAL GENERAL MEETING OF THE CYPRUS SHIPPERS' ASSOCIATION.

The Annual General Meeting of the Cyprus Shippers' Association was held at Nicosia on the 19th April, 1939.

Messrs. H. Llewelyn Jones, O.B.E., and Mr. E. Disney, who were required to retire from the Council in conformity with the articles of Association, were re-appointed. Mr. G. G. Pierides was elected to fill a vacancy caused by the resignation of Mr. D. Severis from the Council.

* * * * *

IRISH DRAUGHT STALLION.

The Irish draught stallion "Bright Boy" imported last year was sent on a tour of villages in the Mesaoria during May and June. He was much admired by horse breeders everywhere. A third Irish draught stallion has been indented for and one of these two will be stationed in the Mesaoria next year.

GOVERNMENT STOCK FARM, AUCTION SALE.

An auction sale was held at the Government Stock Farm on May 5th, when the following average prices were realized :—

	£	s.	p.		£	s.	p.
2 heifers	8	10	0	2 sows	5	3	4½
4 rams	2	15	7	11 gilts	1	1	8
6 ewes	—	16	2	13 young boars ..	1	5	3
19 ram lambs ..	1	3	7	65 head of poultry	—	2	5
12 he-kids	—	8	4	114 chickens ..	—	1	0

Total amount realized £116, 13s. 4½p.

The demand for piglings was particularly keen, and the prices paid for three months old pigs was exceptionally high. The demand for poultry was not as keen as in November last.

* * * * *

LOCUSTS.

The hatching of locusts was rather late, compared with other years, owing to the cool and wet weather. Locusts are more abundant than they have been for the past few years.

* * * * *

GATHERING OF ALMONDS.

The following is a copy of a poster issued for circulation in the almond growing villages :—

“ Department of Agriculture.

GATHERING OF ALMONDS.

The practice, which is widespread in certain districts, of picking almonds before full maturity, leads to poor quality produce. Immature almonds, when dry, weigh less than almonds picked when fully ripe, the kernel is wrinkled, thin and of bad quality and taste. The poor quality of commercial samples, brought about by the admixture of immature almonds, is endangering the good reputation of Cyprus almonds abroad.

Almond-growers are urged not to pick their crop until the correct time, when the outer coat detaches easily from the inner shell.

Almonds should not be picked before :—

JULY 15TH ON THE PLAINS.

AUGUST 1ST ON THE HILLS.

DIRECTOR OF AGRICULTURE.”

* * * * *

VISIT OF BOTANIST.

Dr. Lindberg, the Finnish botanist, and his two sons have recently arrived in Cyprus for a stay of about two months during which they hope to make an extensive study and collection of the Island's flora. One of the party is also collecting insects, with special reference to the *Hemiptera*.

An Analysis of Farming Costs in Cyprus.

BY H. M. JAMES, DIP. AGR. (I.C.T.A.), *Superintendent of Agriculture,*

AND

CH. C. KOUMIDES, C.D.A. (Reading), *Agricultural Officer.*

1. INTRODUCTION.

Costing, in connection with Cyprus Agriculture, has been neglected in the past and there are very scanty data readily available to serve as a guide to the prospective settler. The Cyprus Government farms and many of the progressive farmers have been keeping accurate cost accounts for many years and it was felt that an analysis of these costs would be of great value to persons wishing to take up agriculture in the Colony. The figures given refer to actual costs, mainly taken from the records of the Central Experimental Farm, Morphou, and while no assurance can be given that these costs will remain the same year by year or will be the same in any part of the Island, at all events they do refer to the actual experience of trained agriculturists and are of more value than the estimates of persons with little experience of the country. It is not possible to obtain accurate figures concerning the costs of production incurred by the peasant proprietor, and to do so is not attempted in this paper. It is hoped, however, that the information will prove of use to farmers, intending settlers, and Officers of the Agricultural Department and will dispel much of the mystery which surrounds the profits and losses in Cyprus Agriculture.

2. PERMANENT AND CASUAL LABOUR.

Agricultural labourers in Cyprus are plentiful except, perhaps, at harvest time, during May and June, when wages show a tendency to rise. Large numbers of labourers are employed in the copper, asbestos and other mines at higher wages than the farmer is able to pay, but except in the vicinity of these mines there is never any shortage of labour through this cause. Furthermore, the average labourer, being a countryman born and bred, finds work in the fields healthier and more congenial.

The absence of any labour shortage makes it possible to employ a large proportion of casual labourers during the rush seasons and to dismiss them during slack periods. Similarly, these labourers, being paid by the day, are not employed on rainy days or other days when climatic conditions are not favourable. Farming is, therefore, considerably simplified and a much wider range of crops can be grown than would be the case if a fixed number of labourers were employed throughout the year. Casual labourers are, however, invariably unskilled and have no interest in the welfare of the farm on which they are employed, thus making it necessary to employ a certain number of permanent and semi-permanent labourers of varying degrees of skill in the more important operations. For example, there is a shortage of good mechanics and foremen and when the services of one or other are obtained, it is advisable to put them on a permanent basis without delay.

The wages paid to the various types of labourers are given below:—

1. Unskilled women	.. ..	6-7p. per day, increased to 9p. per day during harvest time (May-June).
2. Boys	.. ..	6-9p. per day.
3. Unskilled men	.. ..	12-15p. per day.
4. Ploughmen, irrigation men and other semi-skilled workers	.. ..	2s.-2s. 4½p. per day.
5. Carpenters	.. ..	3s. 3p. per day.
6. Masons	.. ..	3s. 3p. per day.
7. Skilled gardeners	.. ..	2s. 4½p.-3s. per day.
8. Tractor drivers	.. ..	3s. per day.
9. Mechanics	.. ..	4s. per day.
10. Grooms	.. ..	£4-£5 per month.
11. Foremen	.. ..	£4-£5 per month.



Cyprus Working Cows.

Task and piece work, which are largely used in other countries with similar labour conditions, are only slightly used in Cyprus. They do not appear to be suitable for the Cypriot worker's mentality and efforts to utilize the systems at the Central Experimental Farm in 1938 were not successful. It is, moreover, always extremely difficult to change the established order in Cyprus, even in small things. Labourers must, therefore, be employed by the day and an energetic foreman is necessary to get the best out of the labourers.

Harvesting of cereals is perhaps the only kind of farm work that is given out to labourers on piece work at a certain rate (2s. 4½p. to 3s.) per donum, which varies according to the state of the crop.

The hours worked by farm labourers vary month by month in accordance with the time of sunrise and sunset. At the Central Experimental Farm the following time-table is observed:—

	a.m.		p.m.
November to January	7 9; 9.15-12	..	1-4.30
February to March	7 9; 9.15-12	..	1-5
September to October	7-8; 9.15-12	..	1-5
April to August	6-8; 8.30-12	..	2-6

Longer hours are often the rule on private farms, but it is doubtful whether more work is performed. During the summer months a long lunch hour is recommended. The average number of hours worked per day for the whole year is 8.93. In summer, 9½ hours per day are worked and in winter between 8¼ and 8½ hours per day. It follows that constructional jobs, such as putting up buildings and making concrete water channels, should be done in summer when the longer day will bring down the cost. The absence of rain in the summer lends still more point to this argument.

3. WORKING ANIMALS.

The work animals of most use on a Cyprus farm are mules, oxen and working cows. The mules are of light to medium build and are very hardy. The oxen are heavy animals with a hump to which the yoke is attached. In general it is understood that the mule works faster with a light load, but the ox is capable of pulling a heavier load. This has not been observed at the Central Experimental Farm and mules are preferred under most circumstances as they are somewhat cheaper to keep and are more adaptable.

In calculating the cost per actual working day, it was found that mules were considerably cheaper to keep than oxen, which is due to the fact that mules were worked on many more days per year for carting and other operations where a single animal was required.

The animals kept at the Central Experimental Farm during 1938 were: 8 mules, 1 pair of oxen and 1 pair of cows, and the following tables of costs refer to these animals. The oxen were sold on account of age to the butcher early in 1939 for the same price as had been paid for them 6 years previously. Mules on the other hand depreciate at about 8% per annum.

Cost of mule labour (one pair) kept at Central Experimental Farm, Morphou, during the Year 1938.

Food and litter :—					£	s.	p.
45 kilés barley at 2s. per kilé	..	..	..	..	4	10	0
52 kilés oats at 1s. 6p. per kilé	..	..	..	..	4	6	6
730 okes ground carobs at 1½p. per oke	..	..	..	..	6	1	6
Value of ½ donum green barley	..	..	..	..	—	10	0
36 camel loads straw at 2s. per load	..	..	..	..	3	12	0
					£19	8	3
Deduct value of manure (120 loads at 4½p. per load)	..			..	3	0	0
Net food cost per annum	..	..	..	..	£16	8	3
Depreciation :—							
8% on £40, value of mules	..	..	..	..	3	4	0
Miscellaneous :—							
Man labour (one man looking after 15 animals drawing 3s. 3p. per day), share for pair of mules at 4p. per day	..			..	8	2	2
Shoeing, 6 times renewal at 4s. and 6 times repair at 2s.	..			..	1	16	0
Harness repairs	..	..	..	..	—	5	0
15% depreciation on harness and equipment used on							
£8 capital	..	..	..	..	—	18	0
Total cost per annum	..	..	..	..	£30	13	5

The mules worked on the farm during the year 1938,
for 170 days.

Cost per pair of mules <i>per working day</i>	.. ..	3s. 5½p.
Cost per mule <i>per working day</i>	.. ..	1s. 7½p.
Cost per mule <i>per day</i>	.. ..	7p. 23 paras.



Light Cyprus Mules.

*Cost of ox labour (one pair) kept at Central Experimental Farm, Morphou,
during the Year 1938.*

Food and litter :—		£	s.	p.
52 kilés oats at 1s. 6p. per kilé	.. ..	4	6	6
30 kilés vetches at 4s.	.. ..	6	0	0
730 okes ground carobs at 1½p. per oke	.. ..	6	1	6
730 okes cotton seed at 1p. per oke	.. ..	4	1	1
Value of 2 donums green barley at 20s.	.. ..	2	0	0
Value of 1 donum maize as green fodder	.. ..	1	0	0
48 camel loads straw at 2s. per load	.. ..	4	16	0
		£28	5	4
<i>Deduct value of manure (180 loads at 3p.)</i>	.. ..	3	0	0
Net food cost per annum	.. ..	£25	5	4

Depreciation :—

A pair of oxen bought in 1933 for £35 were sold in 1939 for
£35, after 6 years' work.

Miscellaneous :—

Man labour (one man at 30p. per day looking after 15 animals), share for oxen at 4p. per day	£	s.	p.
Shoeing 6 times at 4s. each time	8	2	2
Repairs and depreciation on harness and equipment used, 20% on £1	1	4	0
	—	4	0
Total cost per annum	£34	15	6

The pair of oxen worked on the farm during 1938 for 140 days.

Cost per pair of oxen per working day	5s. approx.
Cost per ox per working day	2s. 4½p.
Cost per ox per day	8p. 23 paras.

Cost of cow labour (one pair) kept at Central Experimental Farm, Morphou, during the Year 1938.

Food and litter (including feeding of offspring) :—	£	s.	p.
40 kilés oats at 1s. 6p. per kilé	3	6	6
24 kilés vetches at 4s. per kilé	4	16	0
550 okes cotton seed at 1p. per oke	3	1	1
550 okes ground carobs at 1½p. per oke	4	11	6
Value of one donum green barley	1	0	0
Value of ½ donum maize as green fodder	—	10	0
36 camel loads straw at 2s. per load	3	12	0
	£20	17	4
Deduct value of manure (150 loads at 3p. per load) ..	2	10	0
Net food cost per annum	£18	7	4

Depreciation :—

A pair of cows may be sold at approximately the same price for which they were bought when they are no more used for work.

Miscellaneous :—

Man labour (one man looking after 15 animals drawing 3s. per day), share for pair of cows, 4 piastres per day ..	8	2	2
Shoeing, 6 times at 4s. each time	1	4	0
Repairs and depreciation on harness and equipment used, 20% on £1	—	4	0
	£27	17	6
Deduct value of two calves at £1 each when one year old ..	8	0	0
Total net cost per annum	£21	17	6

The pair of cows worked actually on the farm during 1938 for 70 days.

Cost per pair of cows per working day	6s. 2p.
Cost per cow per working day	3s. 1p.
Cost per cow per day	5p. 16 paras.

4. WORK PERFORMED BY WOMEN.

Women are employed on the less strenuous jobs of the farm which are almost entirely weeding and hoeing. Provided their work is supervised, they can perform a good day's work and work more steadily than do men. Older women do better work than young, but it is never possible to leave a gang of women to finish a job by themselves.

The following table shows the amount of work that can be done by the average woman in a day:—

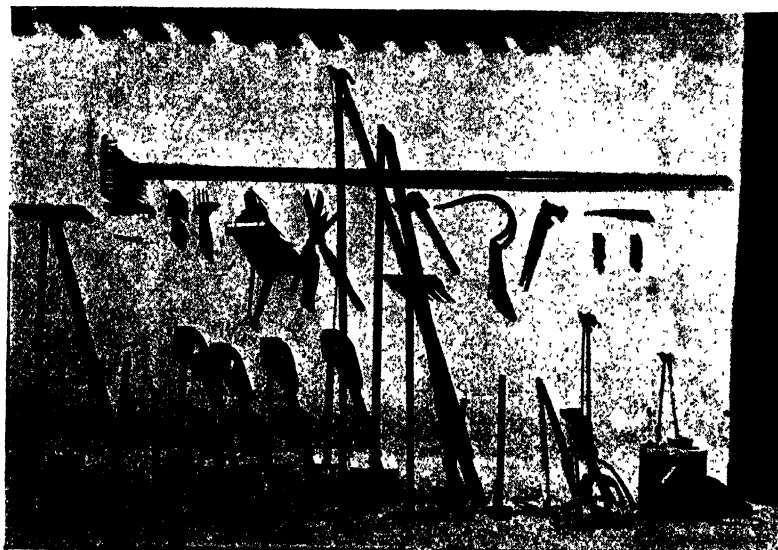
<i>Crop</i>	<i>Operation</i>	<i>Quantity or area</i>	<i>Woman-days per donum</i>	<i>Cost per donum</i>
Wheat .. (in drills)	.. Hoeing	.. 1/3 donum	.. 3	.. 2s.
Broad beans ..	.. „	.. 1/4 „	.. 4	.. 2s. 6p.
Cumin ..	.. Weeding	.. 1/8 „	.. 8	.. 5s. 3p.
Onions..	.. Hoeing	.. 1/6 „	.. 6	.. 4s. 0p.
Peas ..	.. „	.. 1/4 „	.. 4	.. 2s. 6p.
Cotton..	.. Removing stalks.	.. 2 donums..	1/2	.. — 3p.
„	.. Planting on ridges.	.. 1/2 donum	.. 2	.. 1s. 3p.
„	.. Thinning	.. 1/2 „	.. 2	.. 1s. 3p.
„	.. Hoeing and weeding.	.. 1/3 „	.. 3	.. 2s. 0p.
„	.. Picking	.. 15 okes	..	..
Cereals	.. Binding shieves.	.. 1 donum	.. 1	.. 1s. 0p.
Haricots } Cowpeas }	.. Harvesting	.. 20 okes	..	..
Nursery	.. Hoeing and Weeding	.. 1/12 donum..	12	.. 8s.—12s.
Vetches } Vicos .. }	.. Harvesting	.. 1/2 „	.. 2	.. 1s. 3p.—2s.
Cumin .. }				

5. WORK PERFORMED BY MEN.

The average male labourer has a good practical knowledge of farming operations in their most primitive forms. Very often he is a farmer who has lost his land to the money-lender or whose land is not sufficient to supply the needs of his family. He is usually a good worker,

The following table shows the work that can be performed by the average male labourer:—

<i>Crop</i>	<i>Operation</i>	<i>Quantity or area</i>	<i>Man-days per donum</i>	<i>Cost per donum</i>
Cereals	.. Broadcasting ..	15 donums ..	1/15 ..	1p.
"	.. Distribution ..	12 " ..	1/12 ..	1p.
	of fertilizer at 40 okes per donum.			
Vetches } Vicos .. }	.. Broadcasting ..	20 " ..	1/20 ..	0½p.
Nursery	.. Digging 18" deep. ..	1/30 " ..	30 ..	£2. 5s. 0p.
Orchard	.. Forking 9" deep. ..	1/6 " ..	6 ..	9s.
"	.. Digging holes 2' x 2' x 2' ..	20 holes ..	..	0½p. per hole
"	.. Grafting young trees. ..	120 trees ..	..	
"	.. Budding young trees. ..	150 trees ..	..	
Cereals	.. Flooding ..	5 donums ..	1/5 ..	4p.
Cotton..	.. Irrigating ..	2 " ..	1/2 ..	1s. 1p.
Flax ..	.. Uprooting ..	1/4 " ..	4 ..	6s.
Sesame	.. " ..	1/2 " ..	2 ..	3s.
Summer Crops.	.. Ridging by hand 2½ feet apart. ..	1/2 " ..	2 ..	3s.
Cereals	.. Harvesting ..	1 " ..	1 ..	1s. 4½p.



Hand Implements.

6. PLOUGHING, CULTIVATING, ETC., USING ANIMAL DRAUGHT.

The following Table (a) shows the area that can be ploughed or cultivated, etc., using animal draught. The mules refer to Cyprus-bred light mules which are strong, hardy and quick moving. The oxen are also Cyprus-bred and are large, heavy animals possessing a small hump which takes the yoke :—

TABLE (a).

Operation	Description of implement, etc.	Quantity per day donums
Ploughing ..	"Gallows" 1 furrow, heavy digger plough, 2 mules	2
	"Victory" 1 furrow, light digger plough, 1 mule	1½
	Light 2-furrow plough, 2 mules	4
Harrowing ..	"Spring time" harrow, 4-foot span, with 12 teeth set in 3 rows, 2 mules	15
	"Zig-Zag" harrow, 8-foot total span in 3 sections. Each section with 20 teeth set in 5 rows, 2 mules	30
Seed covering..	Light 4-furrow plough, 2 mules	6
Rolling ..	Light wooden roller, 7-feet span, 1 mule ..	30
" ..	Heavy clod-crushers, 7-feet span, 2 oxen ..	20
Ridging ..	3-furrow ridger, 2 mules	5
Manure distributing..	Distributor with 8-feet span, 1 mule	20
Drilling ..	"Hornsby" precision drill. 4' 6" span, 2 mules	12
cereals. ..	Combine reaper and binder. Span of knife 5 feet, 3 mules	15

Table (b) shows the cost per donum of the various operations described in Table (a). The depreciations of the implements are not included in the cost except in the case of the cereal reaper and binder which is calculated to depreciate at the rate of 3p. per donum. For ploughs and cultivators the depreciation per donum is negligible.

TABLE (b).

Calculation per donum.

Operation.	Man and/or woman, days	Mule or Ox, days	Cost per donum
Ploughing :			
Gallows' plough ..	1/2 man day ..	1 mule day ..	2s. 8p.
Victory plough..	2/3 ..	2/3 ..	2s. 6p.
2-furrow plough ..	1/4 ..	1/2 ..	1s. 4p.
Harrowing :			
Spring time harrow ..	1/15 man day ..	2/15 mule day ..	3½p.
Zig-zag harrow ..	1/30 ..	1/15 ..	2p.
Light seed-covering plough	1/6 ..	1/3 ..	1s. 0p.
Light wooden roller ..	1/30 ..	1/30 ..	1p.
Heavy clod crushing ..	1/20 ..	1/10 ox day ..	3½p.
Ridging	1/5 ..	2/5 mule day ..	1s. 1p.
Manure distributing ..	1/20 ..	1/20 ..	1½p.
Drilling cereals ..	1/12 ..	1/6 ..	1p.
Reaping cereals *	{ 1/15 .. } 1/5 woman day	1/5 ..	1s. 3p.

* Includes value of string at 3p. per donum and depreciation of reaper at 3p. per donum.

7. PLOUGHING, CULTIVATING, ETC., WITH TRACTOR DRAUGHT.

The records from 1932-37 inclusive of the work performed by a 28 h.p. Clayton tractor are summarized below. This tractor was economical in running costs, but was often difficult to start and was idle for long periods for repairs. However, it may be taken as a typical example of the costs incurred when a tractor is used under Cyprus conditions.



Harvesting Cereals with a Reaper and Binder.

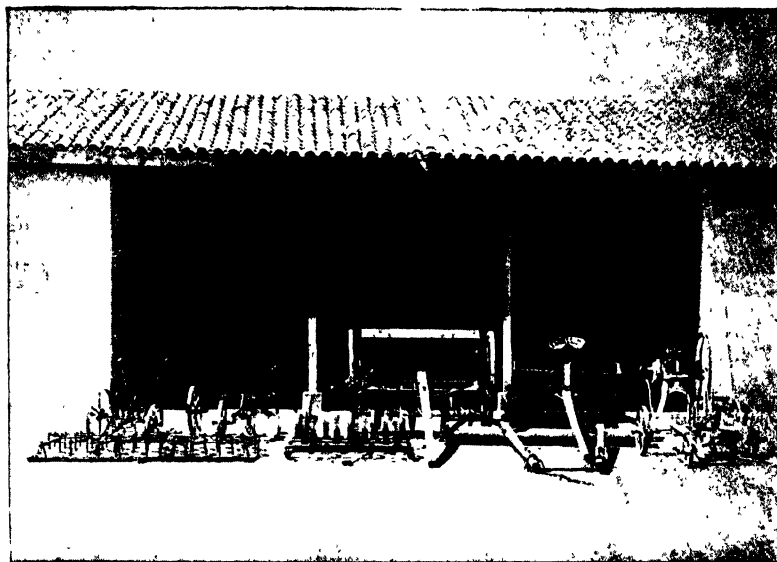
Cost of maintenance of Clayton 28 h.p. diesel tractor per hour
(summary of five years costs):—

	p.
Diesel oil	3.9
Lubricating oil	5.5
Gear oil	0.5
Grease	0.7
Wages	4.8
Depreciation	12.4
Repairs	5.6
Sundries	0.4

Total cost per hour 3s. 6p. 32 paras.

During the 5 years, the tractor worked for 2,538 hours divided into 447 days, which gave the average number of hours per working day as 5.678 hours per working day. The hours of work were spent in ploughing with a heavy 3-furrow plough, harrowing with a spring time and zig-zag harrow, rolling with a clod-crusher and working a Clayton thresher. The output per hour at each of these operations and the cost per donum for cultivations and per oke for threshings were as follows :—

Operation			Donums per hour		Cost per donum
Ploughing	..	..	2.47	..	1s. 5½p. (including ½p. depreciation of the plough per donum.)
Harrowing	..	..	6.57	..	5p.
Rolling	..	..	4.22	..	8p.



Animal-drawn Implements.

Threshing :—

The following amount must be added to the cost per hour :—

Depreciation of the thresher	..	..	1s. 6p. per hour
Wages of feeders	..	..	- 6p. „
Repairs and sundries	..	..	- 5p. „
			2s. 8p. per hour

The quantity threshed per hour and the cost per oke and per kilé for wheat, barley and oats are given below :—

<i>Cereals</i>	<i>Okes threshed</i>	<i>per hour</i>	<i>Cost per oke</i>	<i>Cost per kilé</i>
Wheat	405	..	5.9 paras	.. 3½ piastres
Barley	395	..	6.0 „	.. 2½ „
Oats.. ..	412	..	5.8 „	.. 2 „

The following figures, obtained from a private source, are of interest for comparison with the Central Experimental Farm figures :—

The tractor is a 20 h.p. "International" Caterpillar tractor.

The Combine is a "Case" combine harvester-thresher.



Tractor and Three-furrow Plough.

Cost of Tractor and Combine per hour (Cyprus piastres.)

<i>Tractor (calculated on 3,244 hours of work)</i>		<i>Combine (calculated on 251 hours of work)</i>		<i>Total</i>
	<i>p.</i>		<i>p.</i>	<i>p.</i>
Paraffin ..	13.20	..	11.40	.. 24.60
Petrol ..	0.90	..	0.80	.. 1.70
Lubricating oil and grease ..	2.81	..	2.60	.. 6.29
Gear oil ..	0.88	..		
Wages ..	7.73	..	18.50	.. 26.23
Depreciation ..	4.66 20% on £440 at 400 hours.	..	39.50	.. 44.16
Repairs ..	4.49 (incl. cleaning)	..	1.35	.. 5.84
Spare parts ..	3.10	..	—	.. 3.10
Total ..	37.77	..	74.15	.. 111.92

Work Performed.

<i>Operation</i>	<i>Donums per hour (average)</i>	<i>Cost per donum</i>
		<i>p.</i>
Ploughing	3½ ..	11.62
Disc harrowing	10 ..	3.77
Combine harvesting and threshing	6 ..	18.65
The cost for harvesting with a binder and then threshing by stationary thresher at the Central Experimental Farm is :—		
Harvesting with binder		15
Threshing 8 kilés wheat		26
Total per donum		41

A farm of the size of the Central Experimental Farm, however, would only have use for a combine for 50 hours per annum.

8. IRRIGATION COSTS.

The irrigation system of the Central Experimental Farm consists of a well, about 85 feet deep, from which the water is pumped by an installation consisting of an 18 h.p. Petter engine and a locally made deep well plunger pump. The water is pumped to a tank above the well, the base of which is 20 feet above ground. From this tank the water flows along 1,200 feet of 6 inches pipe to a large concrete storage tank on the highest point of farm whence the water can flow through concrete channels to any point of the farm.

The capital cost of the installation, excluding the cost of the concrete tank and channels is as follows :—

<i>Complete installation, completed June, 1933.</i>	<i>£</i>
Value of Petter 18 h.p. diesel engine	200
Value of pump	45
Cost of installation including well-boring, tank, engine house, etc.	200
Value of 1,200 ft. 6 inches pipe line to main concrete tank	210
Sundries, including laying of pipe line	45
	£700

After 5½ years running, the engine and pump are in good order and are estimated to be worth £85. The total depreciation from June, 1933, to December, 1938, is, therefore, £160.

The cost of operating the pumping unit per hour, average of 5½ years, works out as follows :—

<i>(Number of hours worked : 14,150.)</i>	<i>piastres</i>
Fuel, oil, grease, etc.	7.93
Labour	1.20
Repairs and sundries	0.87
Interest on capital £700 at 4%	1.96
Depreciation of pump and engine	2.04
	14.00

The pumping unit delivers an average of 78 tons per hour to the main concrete tank. The cost of water delivered at this tank works out at 7.18 *paras* per ton.

To carry the water to various points on the farm, there are 11,000 feet of concrete water channels. Thus, to make the water available all over the farm, the following expenses were incurred:—

Concrete tank 100 feet square by 5 feet deep	..	450
Concrete channels, 11,000 feet	.. ..	360
Total	.. ..	<u>£810</u>

The interest at 3% per annum and the depreciation (3% per annum on the value of the tank and channels work out at a further 1.56 *para* per ton. The total cost of water delivered to the field is therefore 8.7 *paras* per ton and the total cost of bringing irrigation water within the reach of all parts of the main farm block of 600 donums is £1,510 or about £2. 10s. per donum.

Three sizes of concrete channels were made on the farm during 193 and a summary of the cost of these may be of interest.

Detailed Statements of the Cost of Water Channels.

(Size I : 14" wide by 12" deep.)

Description:—

Size of bottom : 24" wide by 4" thick.

Size of sides : 12" deep by 4" thick.

Outlets at every 100 feet on both sides.

Cost per 100 feet:—

	£	s.	p.
Gravel 5 car loads at 30 piastres each	.. ..	16	6
Cement 8 bags (40 okes each) at 23 piastres	.. ..	1	0 4
Lime 162 okes at 13 <i>paras</i> per oke	.. ..	5	7
Outlets 2, at 11 piastres each		2	4
Wages		1	2 0
Depreciation on value of equipment used		1	0

Total		<u>£3</u>	<u>8</u>	<u>3</u>
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Cost per running foot, 6 piastres and 7 *paras*.

(Size II : 10" wide by 8" deep.)

Description:—

Size of bottom : 18" wide by 4" thick.

Size of sides : 8" deep by 3" thick.

Outlets at every 100 feet on both sides.

Cost per 100 feet:—

	£	s.	p.
Gravel 3½ car loads at 30 piastres each	.. ..	11	6
Cement 5 bags at 23 piastres (40 okes each)	.. ..	12	7
Lime 120 okes at 13 <i>paras</i> per oke	.. ..	4	3
Outlets 2, at 8 piastres each		1	7
Wages		16	6
Depreciation on value of equipment used		—	6

Total		<u>£2</u>	<u>7</u>	<u>8</u>
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Cost per running foot, 4 piastres and 12 *paras*.

(Size III : 8" wide by 6" deep.)

Description :—

Size of bottom : 16" wide by 3" thick.

Size of sides : 6" deep by 3" thick.

Outlets at every 50 feet on both sides.

Cost per 100 feet :—

	£	s.	p.
Gravel 2½ car loads at 30 piastres each	—	8	3
Cement 3½ bags (40 okes each) at 23 piastres	—	9	0
Lime 80 okes at 13 <i>paras</i> per oke	—	2	6
Outlets 4, at 6 piastres each	—	2	6
Wages	—	12	0
Depreciation on value of equipment used	—	—	4
Total	£1	15	1

Cost per running foot, 3 piastres and 6½ *paras*.

At the Central Experimental Farm, only concrete channels have been used up to the present for carrying water to various parts of the farm. In citrus groves it is usual to use 6 inches concrete pipes sunk about 2 feet below ground. The cost of these pipes is approximately as follows :—

	s.	p.
Cost of pipes (including outlets every 30 metres) ..	1	4½ per metre
Cost of laying pipes, etc.	—	4½ „ „
Total cost	2s.	per metre or 5½p. per foot.

Overhead irrigation is also beginning to attract attention in Cyprus and an estimate of the cost of installing this system at the Central Experimental Farm is given below :—

Central main pipe line (4,000' of 6" pipe)	
Branch pipe lines totalling (6,000' of 6" pipe)	£
Total 10,000 feet 6" pipe @ 15p. per foot laid ..	850
4 600' oscillating spray lines complete	240
110 2½" stand pipes and screw valves @ £1 each ..	110
Total	£1,200

Owing to the increased pressure of water necessary to overcome friction in the pipes and work the oscillators, only 45 tons (instead of 78 tons) would be delivered, on the average, per hour by the spray lines. The cost of water per ton delivered at the field, exclusive of depreciation and interest on value of pipes, etc., would be 12.5 *paras* as compared with 7.18 *paras* delivered by flow irrigation. When depreciation of the channels and the interest on capital is included in the calculation, the overhead irrigation system delivers water in the field at 16.8 *paras* per ton as compared with 8.74 *paras* per ton by flow. It is not yet possible to answer the question of whether other advantages of over-head irrigation would make up for the increased cost of water.

*Irrigation Requirements and Costs for certain Crops.**Cost of Water 8.74 paras per ton.*

Crop	Wheat	Cotton	Haricot beans	Potatoes winter crop	Table grapes	Citrus one year
No. of irrigations required per annum	1	8	3	3	2	12
Water required :—						
(a) Per irrigation (tons per donum)	200	100	120	120	150	100
(b) Total per crop (tons per donum)	200	800	360	360	300	1,200
(c) Cost of water per irrigation (piastres) ..	43½p	22p.	26p.	26p.	33p.	22p.
No. donums irrigated per man day	5	2	2	2	2	4
Labour cost per donum per irrigation	4p.	10p.	10p.	10p.	10p.	5p.
Total cost per irrigation ..	47½p	32p.	36p.	36p.	43p.	27p.
Total cost for all irrigations	5s. 2½p.	28s. 4p.	12s.	12s.	9s. 5p.	26s.

Haricot beans and potatoes (winter crop) require two floodings, in July and August, prior to sowing. The total cost for these two floodings may be taken as 10s.

9. BUILDING COSTS FOR FARM BUILDINGS.

Farm buildings can be made of concrete, stone, corrugated iron or any of the usual building materials, but, under Cyprus conditions, buildings made of mud-brick will probably prove quite satisfactory and reasonably cheap. The farm buildings made at the Central Experimental Farm are all constructed from this material and have proved satisfactory up to now. It is estimated that mud-brick buildings, properly constructed and plastered will last for 50 years or more.

There are certain points in the construction of mud buildings which are worth stressing :—

(1) The bricks should rest on a concrete foundation, raised at least 1 foot, and should not make contact with the ground.

(2) Straw must not be stinted in the manufacture of the bricks.

(3) The walls should be plastered when fully dry and kept plastered.

The cost of making mud-bricks at the Central Experimental Farm, inclusive of labour and straw worked out at 10s. per 1,000. (Mud-bricks bought from a maker cost 15s. per 1,000.)

The size of a brick is 18"×12"×3".

Other costs in connection with the buildings are :—

Concrete floor per square yard 1s. 3p.

Plaster composed of 1st lining ; 6 parts sand, 2 parts lime and ½ part cement, 2nd lining ; 2 parts sand and 1 part lime, per square yard 4½p.

Locally-made tiles per 1,000 20s.

Cost of production of various buildings at Central Experimental Farm.

1. Grain Store.

Description :—

Size 55'×15'. Height of walls=10' front 14' middle.

Divided into 10 partitions with pathway.

Floor and partitions made with concrete.

Walls lined inside with concrete to a height of 5',

Cost :—

90 cart loads gravel @ 4½p.	..	..	..	2	5	0
20 cart loads sand @ 4½p.	..	..	..	—	10	0
8,000 mud-bricks @ 10s. per thousand	..	..	..	4	0	0
3,000 okes lime @ 13 paras per oke	..	..	..	5	8	3
60 bags cement @ 2s. 6p. per bag	..	..	..	8	0	0
4,000 tiles (corrugated) @ £1 per thousand	..	..	..	4	0	0
10 pieces reed mattings @ 5s. each	..	..	..	2	10	0
Timber, including doors and windows	..	..	..	18	0	0
Wages	..	..	..	32	0	0
Sundries	..	..	..	3	6	6
Total	..	..	..	£80	0	0

Description :—

Floor made with concrete.

Walls both inside and outside plastered.

Cost :—									£	s.	p.
25 cart loads gravel @ 4½p.	..	..	..	..	..	..	..	..	—	12	4½
5 cart loads sand @ 4½p.	..	..	..	..	..	..	..	..	—	2	4½
1,000 oke lime @ 13 paras per oke	..	..	..	..	..	..	..	..	1	16	1
3,000 mud-bricks @ 10s. per thousand	..	..	..	..	..	..	..	..	1	10	0
10 bags cement @ 2s. 6p. each	..	..	..	..	..	..	..	..	1	6	6
1,000 corrugated tiles @ £1 per thousand	..	..	..	..	..	..	..	..	1	0	0
2 pieces reed mattings @ 5s. each	..	..	..	..	..	..	..	..	—	10	0
Timber including door and window	..	..	..	..	..	..	..	..	5	0	0
Wages	..	..	..	..	..	..	..	..	7	0	0
Sundries	..	..	..	..	..	..	..	..	1	2	2
Total	..	..	..	..	..	..	..	..	£20	0	0

Description :—

Accommodation for 6 animals.

Inside walls lined with concrete to the height of 5'.

The remaining parts of the walls inside and outside were plastered.

Cost :—	£	s.	p.
70 cart loads gravel @ 4½p.	3	10	0
6 cart loads sand @ 4½p.	—	3	0
2,000 oke loads @ 13 paras per oke	3	12	2
6,000 mud-bricks @ 10s. per thousand	3	0	0
3,000 corrugated tiles @ £1 per 1,000	3	0	0
40 bags cement @ 2s. 6p. each	5	6	6
6 pieces reed mattings @ 5s. each	1	10	0
Timber, including doors and windows	13	10	0
Wages	34	0	0
Sundries	2	8	1
Total	£70	0	0

Description :—

4. *Stable.*

Size 12' × 15'.

Accommodation for 2 animals.

Floor, mangers and troughs for watering made with concrete.

Inside walls lined with concrete to the height of 5'.

The remaining parts of the walls inside and outside were plastered.

Cost :—

	£	s.	p.
30 cart loads gravel @ 4½p.	—	15	0
5 cart loads sand @ 4½p.	—	2	4½
1,000 okes lime @ 13 paras per oke	1	16	1½
3,000 mud-bricks @ 10s. per thousand	1	10	0
1,000 corrugated tiles @ £1 per thousand	1	0	0
20 bags cement @ 2s. 6p. each	2	13	3
2 pieces reed mattings @ 5s. each	—	10	0
Timber, including door and window	5	0	0
Wages	16	0	0
Sundries	—	13	0
Total	£30	0	0

Description :—

5. *Straw Barn.*

Size 42' × 14'6".

Capacity for storing 150 camel loads of baled straw.

Floor made with concrete.

Inside walls lined with mud and limewashed.

Outside walls plastered.

Cost :—

	£	s.	p.
48 cart loads gravel @ 4½p.	1	4	0
6 cart loads sand @ 4½p.	—	3	0
1,500 okes lime @ 13 paras per oke	2	14	1½
6,000 mud-bricks @ 10s. per thousand	3	0	0
20 bags cement @ 2s. 6p. each	2	13	3
3,000 corrugated tiles @ £1 per thousand	3	0	0
6 pieces reed mattings @ 5s. each	1	10	0
Timber, including door and 3 windows	12	0	0
Wages	10	10	0
Sundries	—	5	4½
Total	£37	0	0

Description :—

6. *Implements Shed.*

Size 44' × 25'6".

Inside walls lined with mud and limewashed.

Outside walls plastered. One side left open.

Floor earthen.

Cost :—

	£	s.	p.
45 cart loads gravel @ 4½p. each	1	2	4½
6 cart loads sand @ 4½p. each	—	3	0
8,000 mud-bricks @ 10s. per thousand	4	0	0
2,000 okes lime @ 13 paras per oke	3	12	2
15 bags cement @ 2s. 6p. each	2	0	0
4,500 corrugated tiles @ £1 per thousand	4	10	0
8 pieces reed mattings @ 5s. each	2	0	0
Timber	20	0	0
Wages	12	0	0
Sundries	—	12	2½
Total	£50	0	0

Description :—

7. Manure Pit.

Size 24' × 24' × 6'.

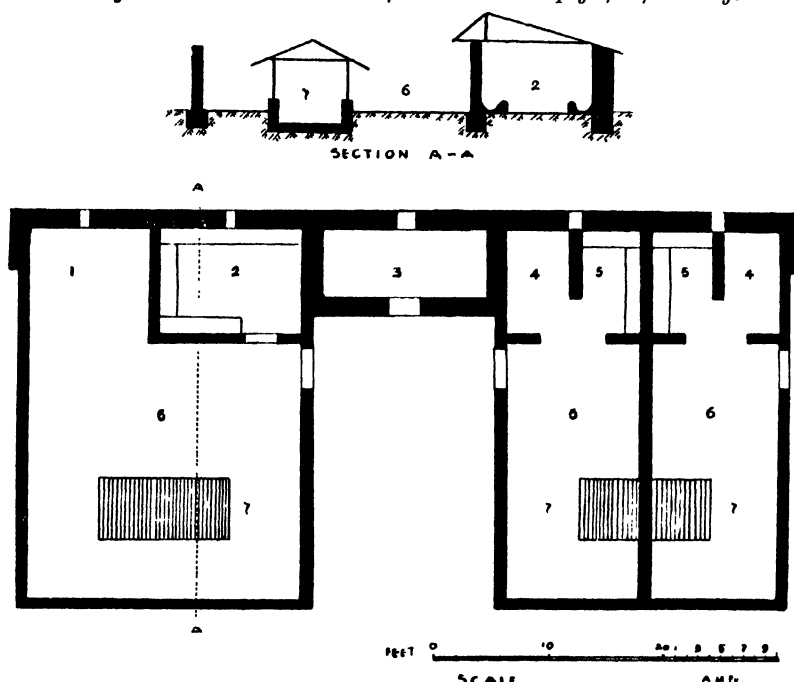
Walls made with concrete 9" thick, and plastered.

Floor made with concrete 4" thick.

Covered with timber roof.

	£	s.	p.
Cost : 60 cart loads gravel @ 4½p. each	1	10	0
4 cart loads sand @ 4½p. each	—	2	0
30 bags cement @ 2s. 6p. each	4	0	0
2,000 oke lime @ 13 paras per oke	3	12	2
Timber	12	0	0
Wages (including excavation)	7	10	0
Sundries	1	5	7
Total	£30	0	0

8. Plan & Cost for erection of pig-styes at Central Experimental Farm, Morphou, during 1936.—Accommodation for 2 sows & 12 pigs for fattening.



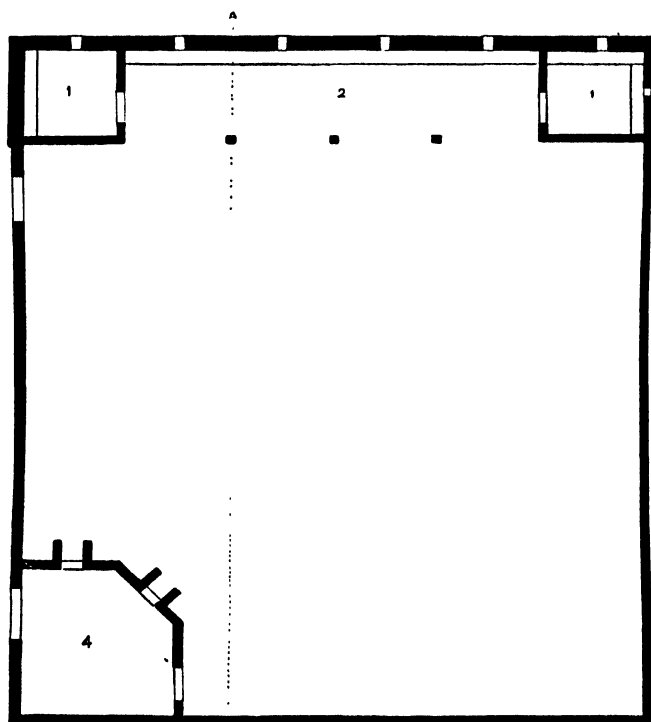
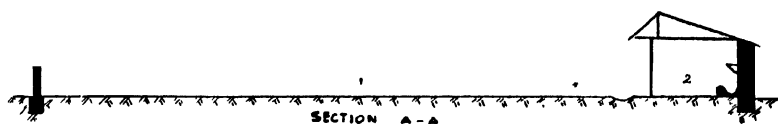
Plan of Pig Styes.

- (1) Covered yard for resting ; (2 & 5) Covered pens for feeding ; (3) Feeding store ;
 (4) Covered furrowing pens ; (6) Open yard ; (7) Water tank covered.

Description : Walls of covered yard, covered pens and feeding store were constructed with mud-bricks, plastered afterwards on both sides and lined on the inside with concrete to the height of 4 feet. The walls enclosing open yard were constructed with lime-concrete and plastered afterwards on both sides. Height of these walls 4 feet 6 inches and thickness 9". The styes were supplied with adequate troughs made with concrete for feeding and watering.

Specification :—

	£	s.	p.
60 cart loads gravel @ 3s. per load	9	0	0
80 bags cement @ 2s. 6p. per bag	10	13	3
3,000 okes lime @ 13 paras per oke	5	8	3
1,000 okes gypsum @ 6 paras per oke	—	16	6
3,000 corrugated tiles @ 20s. per thousand	3	0	0
4,000 mud-bricks @ 10s. per thousand	2	0	0
10 pieces reed-mattings @ 4s. each	2	0	0
Timber	18	0	0
Wages	24	0	0
Sundries	2	1	6
Total	£77	0	0



0 10 20 30 40 50 60
SCALE
A.M.S.

Plan of Sheep Mandra.

(¹) Lambing pens covered ; (²) Covered yard ; (³) Open yard ; (⁴) Milking pen.

9. Plan and Cost of Erection of Sheep Mandra at Central Experimental Farm, Morphou, in 1936.

Cost :— Accommodation for 80 Sheep.

Description :—

Building of wall of lambing pens and covered yard made with mud-bricks, plastered afterwards and lined inside with concrete to the height of 4 feet. Walls enclosing open yard made with lime-concrete, plastered on both sides. Height of these walls 5 feet 6 inches and thickness 9 inches. All floor made with lime-concrete rough 3 inches thick. The *mandra* is supplied with adequate mangers made with concrete and wooden racks for feeding. Also with irrigation troughs made with concrete.

Specification :—	£ s. p.
120 cart loads gravel @ 3s. per load	18 0 0
5,000 okes lime @ 13 <i>paras</i> per oke	9 0 5
120 bags cement @ 2s. 6p. per bag	16 0 0
4,000 corrugated tiles @ 20s. per thousand	4 0 0
3,000 mud-bricks @ 10s. per thousand	1 10 0
6 pieces reed-matting @ 5s. each	1 10 0
Timber	15 0 0
Wages	40 0 0
Sundries	5 0 0
Total	£110 0 5

10. Cost of Construction of one Poultry House and Enclosures.

(a) Poultry House :

Size 12' × 8' × 7'

Accommodation
for 60 birds

	£ s. p.	£ s. p.
Timber	8 7 1	
6 okes nails @ 6p. per oke	— 4 0	
14 bolts with nuts @ 2½p. each	— 3 8	
12 bolts with nuts @ 2p. each	— 2 6	
8 bolts with nuts @ 1½p. each	— 1 1	
28 bolts with nuts @ ½p. each	— 1 5	
14 washers	— — 2	
9 pics wire net @ 5½p.	— 5 4½	
4 locks @ 6p.	— 2 6	
5 gallons solignum @ 6s. 4½p.	1 12 4½	
24 yards water-proof paper @ 6p.	— 16 0	
Wages 1 man for 12 days @ 3s.	1 16 0	
		13 13 2

(b) Enclosure :

Size of yard 78' × 68' divided into two halves and fenced with wire net 6' high.

	£ s. p.
24 wooden posts 9' × 3" × 3" @ 1s. 4½p. ..	1 16 0
120 yards wire net @ 5p.	3 6 6
Gates	— 6 0
Wages 8 men @ 2s.	— 16 0
	6 4 6

TOTAL £19 17 8

10. MISCELLANEOUS COSTS AND PRICES.

The following costs, referring to various operations necessitating the working together of a gang and/or the utilization of a machine, have been calculated at the Central Experimental Farm at various times.

(a) Cotton ginning.

"Platts" double roller gin with 4 feet knife powered by a 3 h.p. Lister engine running on paraffin. One man is needed for the whole time to look after the engine and feed the seed cotton.

Cost per oke of lint $1\frac{1}{2}p.$

(N.B.—Contract price in large ginneries is only $1\frac{1}{4}p.$ per oke of lint.)

(b) Baling straw in a hand press inclusive of struts and wire.

Cost per bale of 100 okes $4\frac{1}{2}p.$

(This cost can be reduced by the use of a horse baler. Also, if the wire and struts are kept from year to year and re-used, the cost is reduced to $1\frac{1}{2}p.$ per bale.)

(c) Fencing. The costs of fencing with imported iron material and local wooden posts are given below. These costs are much larger if the boundary of the land is uneven.

Detailed Statement of Cost per thousand feet of Fencing.

(a) *With Iron Material.*

	£	s.	p.
(5 strands of wire, 3 barb and 2 plain.)			
2 straining pillars $8' \times 2" \times 2"$ with stays complete	3	10	0
37 angle standards $8' \times 2" \times 2"$ with tee plates at 3s.	5	11	0
111 galvanized steel droppers $5' \times 1" \times 1"$ at 1s. . .	5	11	0
1,000 yards barb wire at 20s. per reel of 600 yards . .	1	13	3
666 yards galvanized plain wire at 15s. per reel of 600 yards	—	16	$4\frac{1}{2}$
10 winders at 4s. each	2	0	0
740 pin clips	—	13	0
5 cart loads gravel @ $4\frac{1}{2}p.$ per load	—	2	$4\frac{1}{2}$
4 bags cement (40 okes in a bag) at 23p. each	—	10	2
Wages : Gang of 4 men for 4 days at 8s. per day . .	1	12	0
Total	£22	0	2

Cost per running foot 4 piastres approximately.

(b) *With wooden posts.*

	£	s.	p.
(5 strands of wire, 3 barb and 2 plain.)			
111 wooden posts $8' \times 3" \times 3"$ at 1s. 2p. each	6	15	6
18 wooden posts $8' \times 3" \times 3"$ as stays (2 every 100 feet) at 1s. 2p. each	1	2	0
1,000 yards barb wire at 20s. per reel of 600 yards . .	1	13	3
666 yards plain galvanized wire at 15s. per reel of 600 yards	—	16	$4\frac{1}{2}$
740 pin clips at 8p. per oke (200 in an oke)	—	3	3
Tar	—	5	0
15 cartloads gravel @ $4\frac{1}{2}p.$ per load	—	7	$4\frac{1}{2}$
12 bags cement (40 okes to a bag) at 23p.	1	10	6
Wages : Gang of 4 men for 10 days at 8s. per day . .	4	0	0
Total	£16	14	1

Cost per running foot 3 piastres approximately.

The following prices of various items, April, 1939, are given as a guide to the general cost of materials used in farming.

Cost of various items essential to farming (1939 April).

Manure: Sheep 8-20 p. per load (bag of 4 kilés) at place of delivery.

Goat 8-9

Cow 4½-6

Fertilizers: Sulphate of ammonia

Nitrate of soda

Nitrochalk

Superphosphate

Sulphate of potash

Oil fuel and lubricants: Petrol

Kerosene

Diesel oil

Germ oil "H"

V.P. Petter oil

Feeding Stuffs: Barley

Oats

Ground carobs

Bran

20s. " per bag of 100 kilograms.

19s. per bag of 100 kilograms.

19s. 4½p. per bag of 100 kilograms.

7s. 3p. per bag of 100 kilograms.

20s.

7s. 2p. per tin of 4 Imperial gallons.

4¾ piastres per gallon.

4½ piastres per gallon.

8½ piastres per kilogram

6½ piastres per kilogram.

2s. per kiló.

1s. 6 piastres per kilé.

1½ piastres per oke.

1¼ piastres per oke

(to be continued in next issue.)

WEIGHTS AND MEASURES.

Cyprus Weights and Measures in common use and their equivalents in Imperial Weights and Measures.

<i>Capacity.</i>		<i>Length.</i>	
2 pints	= 1 quart	12 inches	= 1 foot
2 4/5 quarts	= 1 Cyprus litre	2 feet	= 1 pie
4 quarts	= 1 gallon	3 feet or	
8 gallons	= 1 kilé = 1 English bushel (very nearly)	1½ pies	= 1 yard
9 quarts	= 1 kouza / Liquid	33 pies	= 1 chain
16 kouzas	= 1 load / measure.	2,640 pies	= 1 mile.
<i>Weight.</i>		<i>Land Measure.</i>	
400 drams	= 1 oke	1 donum = 60 pies or 40 yds. square	= 14,400 square ft. = 40/121 of an acre
1 4/5 okes	= 1 Cyprus litre	3,025 donums	= 1 acre
44 okes	= 1 kantar	1,936 donums	= 1 square mile
180 okes	= 1 Aleppo kantar	Farmer's don. (irregular) = about 1½ don.	
800 okes	= 1 Ton	<i>Currency.</i>	
100 „ (aprox.)	= 1 Camel load (straw)	40 paras	= 1 piastre
50 „ (aprox.)	= 1 Cart load of manure.	1 piastre	= 1½ pence (English)
		9 piastres	= 1 shilling
		20 shillings	= 1 pound (based on the £ sterling).

The Use of a Baler in Hay-Making.

The baling of hay and, to a lesser extent, straw, is gaining in popularity with farmers in many countries every year.

Numerous makes of baler are now on the market, some stationary and others that can be drawn by a tractor to handle a crop in the field. Some balers are of the press type and others of the "ram" type, but the result is similar in that a close packed, convenient sized bale is obtained which can be easily transported and stacked.

In baling hay it has been found, in England, that a crop can usually be baled slightly sooner than it can be stacked, that is with a slightly higher moisture content, but heating will occur if the moisture content is over 18% though not necessarily causing damage or moulding to the hay.*

* Vide "Jour. Min. Agric." XLV, No. 4, July, 1938.

In baling dry straw no such heating occurs, and it is an extremely economical and convenient way of storing straw, since there is little loss in transport or handling. Chaffed straw, as is produced on the threshing-floors in Cyprus can be baled, but the bales are less efficient and are liable to break in handling if roughly treated.

A McCormick Deering one-horse baler has recently been purchased for the Government Stock Farm and has been used to bale hay and both long and chaffed straw with success. It can bale 6-8 tons in a 10-hour day, the bales being approximately 36" $\times$ 18" $\times$ 14". Three persons are all that is necessary to work it, two feeding and one tying and removing the bales.

It is hoped that it will be possible to introduce more such balers for use in dealing with straw in certain areas.



Baling hay at the Government Stock Farm.

Lysi Agricultural Show.

THE Department of Agriculture in co-operation with the Lysi Village Authorities and the Lysi Agricultural Club will hold a show of Agricultural Produce and Livestock at Lysi village on the 8th September, 1939.

The following is a list of the classes, prize money and conditions of entry :—

Class.	Description.	Minimum quantity to be entered.	Prize Money			Total.		
			1st	2nd	3rd			
Agricultural Produce :			s.	s.	s.	£	s.	p.
1.	Wheat (Kyperounda)	1 kilé	10	5	—	..	—	15 0
2.	Wheat (Psathas) ..	„	10	5	—	..	—	15 0
3.	Wheat (Paphitico) ..	„	10	5	—	..	—	15 0
4.	Wheat (B.X.I.P.I.)	„	10	5	—	..	—	15 0
5.	Barley	„	8	4	—	..	—	12 0
6.	Linseed	2 okes	4	2	—	..	—	6 0
7.	Sesame	„	4	2	—	..	—	6 0
8.	Cotton lint	„	6	4	—	..	—	10 0
9.	Tobacco (yellow leaf, in strings).. ..	„	6	4	—	..	—	10 0
10.	Cumin	2 okes	4	2	—	..	—	6 0
11.	Broad beans	„	4	2	—	..	—	6 0
12.	Haricot beans	„	6	4	—	..	—	10 0
13.	Cow peas	„	4	2	—	..	—	6 0
14.	Lentils	„	4	2	—	..	—	6 0
15.	Louvana	„	4	2	—	..	—	6 0
16.	Potatoes	„	8	4	—	..	—	12 0
17.	Vegetables (collection of not more than 6 varieties)	„	6	4	—	..	—	10 0
18.	Grapes (table)	2 okes	8	4	—	..	—	12 0
19.	Grapes (local)	„	6	4	—	..	—	10 0
20.	Sultanas	„	6	4	—	..	—	10 0
21.	Figs (fresh or dried)	„	6	4	—	..	—	10 0
22.	Almonds (soft-shelled)	„	4	2	—	..	—	6 0
23.	Almonds (hard shelled)	„	4	2	—	..	—	6 0
24.	Olives (green)	„	4	2	—	..	—	6 0
25.	Olives (black)	„	4	2	—	..	—	6 0
26.	Olive-oil	„	4	2	—	..	—	6 0
27.	Honey	„	4	2	—	..	—	6 0
28.	Eggs.. ..	1 dozen	4	2	—	..	—	6 0
29.	Butter	1 oke	4	2	—	..	—	6 0
30.	Halloumi	2 okes	4	2	—	..	—	6 0
31.	Cheese	„	6	4	—	..	—	10 0

Class.	Description.	Prize Money			Total.		
		1st	2nd	3rd			
	<i>Livestock :</i>	s.	s.	s.	£	s.	p.
32.	Stallions(licensed) 2½ years & over	30	20	10	..	3	0 0
33.	Colts, under 2½ years ..	20	12	8	..	2	0 0
34.	Mares with foals at foot ..	30	20	10	..	3	0 0
35.	Mares (not entered in class 34)	20	12	8	..	2	0 0
36.	Fillies, under 2½ years ..	20	12	8	..	2	0 0
37.	Mules, 2½ years and over ..	15	10	5	..	1	10 0
38.	Mules, under 2½ years ..	15	10	5	..	1	10 0
39.	Jack donkeys, 2½ years and over	20	12	8	..	2	0 0
40.	Jack donkeys, under 2½ years ..	15	10	5	..	1	10 0
41.	She-donkeys, 2½ years and over	15	10	5	..	1	10 0
42.	She-donkeys, under 2½ years ..	15	10	5	..	1	10 0
43.	Single horse mare, gelding, mule or donkey in cart	15	10	5	..	1	10 0
44.	Pair of mules in cart	20	12	8	..	2	0 0
45.	Bulls, under 2 years (not more than 2 permanent incisor teeth)	15	10	5	..	1	10 0
46.	Heifers, under 2 years (not more than 2 permanent incisor teeth)	15	10	5	..	1	10 0
47.	Cows, over 2 years	20	12	8	..	2	0 0
48.	Milch cows (any breed)	20	10	—	..	1	10 0
49.	Team of plough oxen	20	12	8	..	2	0 0
50.	Tethered she-goat	10	6	4	..	1	0 0
51.	Tethered she-kid	10	6	4	..	1	0 0
52.	Sheep (1 ram, 3 ewes)	10	6	4	..	1	0 0
53.	Pen of native breed poultry (1 cock, 3 hens)	6	4	—	..	—	10 0
54.	Pen of Cross-bred or R.I.R. poultry (1 cock, 3 hens) ..	6	4	—	..	—	10 0
55.	Best poultry house in Lysi village	10	6	4	..	1	0 0
Total ..					£52	2	0

CONDITIONS.

All classes, except class 55, are open to farmers and livestock owners in Famagusta District and the villages of Arsos, Tremethousha, Melousha, Xylotymbou, Pergamos and Athienou in Larnaca District.

Entries for each class except class 55 must be made at the office of the Secretary on the Showground as follows :—

Entries for classes 1 to 31 before 6 p.m. on the 7th September, 1939.

Entries for classes 32 to 54 before 9 a.m. on the 8th September, 1939.

Entries for class 55 must be made to the Secretary, Lysi Agricultural Club, before 6 p.m. on the 1st September, 1939.

The agricultural produce exhibits will be shown in the school-rooms. This section of the show will be closed to the public during the judging of exhibits.

All produce exhibits and livestock will be judged by Committees appointed by the Agricultural Show Committee whose decision shall be final.

All prize winners in classes 32 to 54 are required to leave their animals in the special enclosures provided in the showyard.

No entries in classes 1 to 31 and no prize winners in classes 32-54 will be allowed to leave the showyard until the parade and prize-winning animals which will be held in the showring before the distribution of the prizes.

Applications for entries should be made to the Agricultural Officer, Famagusta, or the Secretary, Lysi Agricultural Club.

Some interesting Flowering Plants cultivated in Cyprus.

By A. I. SYNGRASSIDES.

BIGNONIAS.

The generic name "Bignonia" derives its origin from the Abbe Jean Paul Bignon, 1662-1743, who was a Court Librarian to Louis XIV.

These plants were probably introduced to Cyprus early in the present century and the profusion and beauty of their flowers make them conspicuous and interesting. They are becoming more and more popular from year to year and seem to like our moderate climate because they all look happy and flower exceptionally well.

The few bignonias which grow now in Cyprus are classified by botanists under various generic names according to their detailed morphological structure. The five different species cultivated in Cyprus are :—

- (1) The yellow climbing bignonia *Bignonia unguis-cati*, Linn.
- (2) The yellow shrub or tree bignonia *Tecoma stans*, Juss.
- (3) The red or scarlet bignonia *Tecomaria capensis*, Spach.
- (4) The creeping bignonia *Campsis radicans*, Seem.
- (5) The white or jasmine bignonia *Pandorea jasminoides* Schumann.

These bignonias set little or no fertile seed in Cyprus so that propagation is usually effected by means of layers or cuttings.

A cutting is a gardener's term for a piece of stem, root, rootstock or leaf, according to circumstances, which, if cut off and planted under suitable weather and soil conditions, will form new roots and buds, reproducing the parent plant. The word cutting when employed in a narrow sense refers rather to parts of the stem, because a part or the whole of the leaf, when so used, is called leaf-cutting and a piece of root or rootstock is called a root-cutting.

A layer is a stem that is made to strike while still attached to the parent plant. Layering is usually practised only with those plants which do not root readily from cuttings. The proper conditions, of moisture, temperature and food supply seem to stimulate the multiplying cells in the cambium zone and they force their way through the bark, and if favourable soil contact is secured, supporting roots are soon developed. The different methods of layering are matters of detail adapted to the varying plants to be dealt with. Normally branches are chosen of rather young wood, which can easily be brought under the soil and which when rooted, can be removed without damage to the mother plant. The most favourable season for preparing layers is usually the spring, the time of most rapid cell-growth. To prepare a layer, a suitable branch is bent down to the ground and held in place by a forked pin—made either of wood or iron—so that a part of it is covered by 2 or 3 inches of rich earth, the end being bent to an upright position and fastened to a stake.

The bend and consequent rupture of the bark may be all that is needed to obstruct the movement of food-material and cause the development of roots at this point. If not, a tongue may be cut not deeper than one-third the thickness of the branch from below upwards, and near a bud or node. A good practice with thick, hard-barked species is the ringing of bark.

Once the layers have been prepared in the proper way a cut on the side of the mother plant and just above the soil is made so that by the time the layer is well rooted it should only be attached very slightly to the mother plant. This cut tends to force the multiplying cells to root more quickly than otherwise.

Some notes on the specific morphology, habit, cultivation, propagation, etc., follow under the latin name of each of the above bignonias :

(1) *Bignonia unguis-cati*, Linn (synonym *Bignonia Tweediana*, Lindl.)—The specific name "unguis" means claws and refers to the 3-parted claw-like tendrils.

It is a climber of Tropical America with a woody stem and lianas which may reach a considerable height if they find a good support. It climbs very easily with its clawed tendrils which hook themselves on any description of wall or tree and its branches which are strong and flexible produce numerous aerial roots which attach themselves firmly to any support.

DESCRIPTION.

It is an evergreen plant with an attractive shiny green foliage. The leaflets are arranged in one pair and are cordate lanceolate and pointed, sometimes 3 inches long or less, with 3-parted claw-like tendrils. The flowers are trumpet-shaped about 2 inches long and 2-4 inches across with a clear, bright yellow tube and with the upper surface of the limb orange-yellow, the throat of the tube is marked with orange lines. The seed pods are 1-2 feet long and just more than one-quarter of an inch broad, green at first turning to dark-brown or black when mature. The seeds are surrounded with a very thin scale and when the pods dehisce they are shed out and are so light than can be blown away by the wind to a good distance.

CULTIVATION.

It stands little frost and preferably is grown against walls facing south or south-east. It is not apparently particular to soil conditions but it would prefer a good, deep and rich loam. The water basin of the plant is hoed and watered whenever necessary, adding to it some nutrients consisting of organic and chemical fertilizers and this should be repeated every 2-3 years if possible.

It requires no pruning unless the grower desires to do so ; under these circumstances the lianas are trained so as to allow a free circulation of air among the branches for the purpose of ripening the wood, as upon this depends the abundance of good flowers. All superfluous branches and weak shoots are removed before the growing season begins and all the branches should be shortened from $1\frac{1}{2}$ to 3 feet according to their strength, this will throw the energy of the plant into the lateral buds which will produce the flowering branches. The flowers begin to appear in spring and are over early in autumn. The long pods are formed when the flowers are over and mature in winter. When they are still green the whole plant has the appearance of an enormous kidney bean plant almost covered with pods.

The yellow climbing bignonia is very useful for covering old walls, dry trees or for improving ugly-looking sites ; if planted however against house walls it provides a nice and attractive green appearance.

PROPAGATION.

Fertile seed may be sown in well prepared beds, wooden boxes, pans or pots, either in the open or in a green-house, provided this is available, or in beds covered with wooden frames topped with glass panes. The sowing is done soon after the seed is mature and preferably just after the cold weather and frosts are over.

The cuttings are obtained in autumn or early winter, before severe frost, and either stored in a cool place, covered with moss or fresh earth to prevent drying, or immediately made into cuttings. These cuttings are usually 6 inches or longer and should contain at least two buds. It is not necessary to cut to a bud at the base, but the upper cut should be made just over one. The cuttings should be obtained from the current year's growth. They are planted with a dibble, in pure sand on the top and a layer of potting soil is placed under the sand, so that the new plants may have something to feed on and not need to be potted so soon after rooting; if this is done good drainage is indispensable. After the cuttings have rooted they can be removed and transplanted in pots, in case they have made a big growth they are cut back to 2 or 3 inches.

Under normal conditions layers should strike in 2 or 4 months, after rooting they can be removed from the old plants and can be treated in the same way as the rooted cuttings.

(2) *Tecoma stans*, Juss. (*Stenolobium stans*, Seem.) Yellow Elder, locally known as Yellow Bignonia.—The generic name is abridged from the Mexican name "Tecomaxochilt". The specific name "stans" means "standing," "erect" or "upright" and refers again to the upright habit of this exquisite plant. The yellow elder is a native of the West Indies and South America.

DESCRIPTION.

It is an upright shrub reaching a height of 15 feet or more. The leaves are odd-pinnate, with 5-11 leaflets which are serrate, glabrous 2-5 inches long and $\frac{3}{4}$ -1 $\frac{1}{4}$ inches broad. The flowers are arranged in large terminal racemes or panicles. The corolla is funnel-shaped, of a rich sulphur yellow colour, 1 $\frac{1}{2}$ inches long. The anthers are pubescent, the calyx with 5 short teeth. It commences to flower in September and a succession of flowers continues till December.

CULTIVATION.

The yellow elder grows exceedingly well and attains an immense size if grown on a sandy-clayish loam, especially if regularly fertilized and mulched. It is the glory of the garden in autumn when it is covered with its large fragrant flowers. Owing to its rapid growth and dense foliage which covers it from the ground, the yellow elder is highly valued as screen for unsightly fences and buildings. In landscape gardening it is very valuable and gives excellent effect if planted in a group and rounded by *Tecomaria capensis* (the red or scarlet bignonia) or the red oleander.

PROPAGATION.

Cuttings are not very successful in the case of the yellow elder and it is more convenient and safer to prepare layers. In the case of this plant layers can be prepared in two ways: either by bending and earthing up low branches leaving outside the soil the top of the branch or by using the aerial layering system. In the case of aerial layering a tin, cut in two equal parts and leaving a hole at the bottom, not much bigger than the thickness of the branch, is employed. The branch to be made into an aerial layer should be staved firmly and the tin should be supported. Whatever method of layering is employed the principle is the same as that already described under the yellow bignonia.

(3) *Tecomaria capensis*, Spach. Scarlet or Red Bignonia. "Tecomaria" is derived from "Tecoma," the specific name "capensis" means "of the Cape" (of Good Hope).

DESCRIPTION.

It is a half-climbing or nearly upright shrub reaching a height of 5-10 ft. branching abundantly from the soil level. The lateral branches are practically never straight but bend downwards. Its leaves are odd pinnate with 7-9 leaflets, broadly oval to ovate, acute serrate, glabrous, from $\frac{1}{2}$ to 2 inches long. Its leaves are always borne on pedunculate terminal racemes; the corolla is tubular and curved, with a 4-partite spreading limb, the upper lip emarginate, orange-red to scarlet, almost 2 inches long. The calyx is 5-toothed.

CULTIVATION.

The cape honeysuckle requires also some sort of good and rich loam, avoiding always chalky and wet soils, otherwise its green and attractive foliage is discoloured and it has the appearance of a plant suffering from chlorosis. Waterings and hoeings are essential and the addition of organic nutrients to the soil makes the plant keep on flowering practically all the year round. It is an essential plant in landscape gardening especially if grown under a yellow banksian rose.

It can either be trained on trellises or become a restricted climber, but it does better if trained to a bush. If several plants are put together at a distance of 6-10 feet apart they will soon make a whole-year flowering hedge. The handsome foliage and scarlet flowers in rather dense clusters make this excellent bloomer an indispensable plant to every flower garden.

PROPAGATION.

The red bignonia rarely sets any seed under our climatic conditions but it can easily be propagated either by cuttings or by layers. As the habit of the plant is to branch from the soil level such layering is made very easy and in fact those branches touching the soil should only be covered with some soil and flooded with water. These branches strike very easily and in a comparatively short time forming an excellent material for propagation.

The green tips of the shoots may also root easily if properly treated in a propagating box or sand.

(4) *Campsis radicans*, Seem., (*Tecoma radicans*, Juss., *Bignonia radicans*, Linn.) (Trumpet-creeper, Trumpet-vine, Trumpet-honeysuckle) known locally as the creeping bignonia.—The generic name "Campsis" means curve, referring to the curved stamens; "radicans" means rooting referring to the creeping habit of the plant.

DESCRIPTION.

It is a high-climbing deciduous shrub, clinging with rootlets which are produced abundantly on each branch. The leaves are odd-pinnate bearing 9-11 leaflets which are oval to ovate-oblong, acuminate, serrate, dark-green above, pale and pubescent beneath, at least along the midrib, $1\frac{1}{2}$ -2 $\frac{1}{2}$ inches long. The flowers are arranged in terminal racemes. The corolla is tubular-funnel-formed, about 3 inches long, with 5 spreading lobes, usually orange with a scarlet limb, the tube being almost thrice as long as the short toothed calyx. The flowers appear from July till September.

CULTIVATION.

The trumpet-creeper requires rather rich, moist soils and sunny positions. It is particularly adapted for covering walls and rocks, as it climbs with aerial rootlets and clings firmly to its support. It does best if planted from the start in rich soil; and in addition it would give excellent results if fertilized at least once a year. It prefers a fertilizer rich in nitrogen and a heavy mulch will also prove very beneficial. It may be grown on posts and tall stumps or on any disliked tree, or may be left to creep and cover a bed.

PROPAGATION.

It can be propagated by creeping branches which can be cut down to one foot. No special treatment of the cuttings is required because aerial roots are produced abundantly and the cuttings obtained should bear such roots. These rooted cuttings can be planted either in pots or directly at their permanent place.

(5) *Pandorea jasminoides*, Schumann. (*Tecoma jasminoides* Lindl. *Bignonia jasminoides*, Hort.) known as the "Bower Plant of Australia, locally known as the "Jasmine Bignonia".—The generic name "Pandorea" refers to "Pandora," a Greek mythological name, the specific name "jasminoides" refers to "jasmynes" owing to the appearance of the plant.

DESCRIPTION.

It is an evergreen climbing shrub without tendrils or roots. The leaves are odd-pinnate with 5-9 leaflets almost sessile, ovate to lanceolate, acuminate, but bluntly pointed, entire glabrous, from 1-2 inches long. The panicles are rather few-flowered usually 1-2 flowers opening at a time on each inflorescence. The corolla is funnel-formed, campanulate with a five-lobed limb with crenate lobes, of a white colour, sometimes suffused with pink, usually rosy pink in the throat, 1½-2 inches long. The calyx is small with 5 lobes. It flowers from August to December but sets no seeds.

CULTIVATION.

This *Pandorea* is a vigorous-growing vine or liana with handsome evergreen foliage and beautiful white or pink rather large flowers. It can be grown against walls or on trellises and can stand a few degrees of frost. It requires rich sandy-clayish loams enriched with good organic manure and a nitrogenous fertilizer. It prefers sunny positions and it should preferably be planted in spots protected from cold, strong or violent winds. On rich and liberally fertilized soil it grows very quickly and it is worthy of cultivation for its dark-green glossy foliage alone. It should, however, be well taken care of and watered during the dry spring, summer and autumn months.

PROPAGATION.

It can be propagated either by green-wood cuttings—if a glass-box is used—or by layers. In the case of green-wood cuttings, green tips are selected and placed in a propagating box with sand, and they should root in two months' time at least. After rooting they may be removed in pots or they can be planted out at once.

DISEASES AND PESTS.

No fungus disease has so far, at any rate, been recorded on the above described plants.

One of the chief insects attacking bignonias is the black and green aphid. This kind of pest can be combated quite easily by using soft or ordinary washing soap mixed with nicotine. Nicotine, an extract of tobacco, is widely used as a contact spray and the soft soap helps to liberate the nicotine and acts as a spreader.

The following formula of nicotine sulphate and soft soap is used by the Department of Agriculture, for spraying against Aphids. To prepare nicotine sulphate spray, about 25 drams of soap is dissolved in 10 okes of water, soft soap being easier to dissolve though ordinary hard soap of good quality can be used. This can more easily be dissolved if hot water is used. To the 10 okes of soap and water $\frac{1}{2}$ fluid ounce or 5 drams of nicotine sulphate is added and well mixed, and the spraying should then be done without undue delay.

When spraying it is necessary for all insects to be wetted with the spray, otherwise they will not be affected and care must be taken to spray the undersides of the leaves and into rolled-up leaves where the insects are to be found.

Meteorological Data, Cyprus.

SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS.

MARCH, 1939.

District and Station	Shade temperature		Total inches	No. of days rain	Rainfall			Dates on which snow fell
	Mean				Greatest fall in one day	Average for 10 years	inches	
	Maxim.	Minim.						
<i>Nicosia District :</i>								
Nicosia	63.03	44.06	1.92	11	0.49	0.86	—	—
Athalassa	—	—	1.75	6	0.44	0.89	—	—
Morphou	63.67	44.90	2.36	9	0.45	0.77	—	—
Makhæras	—	—	7.22	6	2.80	2.06	—	—
<i>Famagusta District :</i>								
Famagusta	65.48	44.81	2.40	12	0.54	0.87	—	—
Akhyritou	63.71	43.19	2.08	8	0.52	0.91	—	—
Rizokarpaso	—	—	3.88	10	0.80	1.29	—	—
Lefkoniko	—	—	1.41	5	0.45	0.94	—	—
<i>Larnaca District :</i>								
Larnaca	61.77	44.40	4.45	10	0.70	1.31	—	—
Lefkara	—	—	5.22	13	1.00	1.67	—	—
<i>Limassol District :</i>								
Limassol	64.23	45.42	3.91	13	0.62	1.46	—	—
Saittas	—	—	7.36	12	1.95	2.76	—	—
Trikoukkia	46.29	32.17	8.93	14	1.80	3.59	2-4.23	—
Alekhtora	—	—	5.20	10	1.06	1.39	—	—
<i>Paphos District :</i>								
Paphos	55.77	48.71	4.38	13	1.15	1.53	—	—
Polis... ..	—	—	3.79	12	0.90	1.75	—	—
<i>Kyrenia District :</i>								
Kyrenia	66.17	49.12	3.34	10	0.75	1.52	—	—

Note.—Compiled from returns furnished by Public Works Department.

APRIL, 1939.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	77.00	51.07	0.03	1	0.03	0.60	—
Athalassa	—	—	Nil	Nil	Nil	0.81	—
Morphou	74.28	48.20	"	"	"	0.49	—
Makhaeras	—	—	"	"	"	1.01	—
<i>Famagusta District :</i>							
Famagusta	76.33	52.20	0.08	1	0.08	0.49	—
Akhyritou	74.60	49.00	0.09	1	0.09	0.52	—
Rizokarpaso	—	—	Nil	Nil	Nil	0.55	—
Lefkoniko	—	—	"	"	"	0.92	—
<i>Larnaca District :</i>							
Larnaca	73.96	50.40	"	"	"	0.74	—
Lefkara	—	—	"	"	"	1.06	—
<i>Limassol District :</i>							
Limassol	75.57	50.77	0.19	2	0.13	0.72	—
Saittas	—	—	Nil	Nil	Nil	1.58	—
Trikoukkia	62.75	46.44	"	"	"	2.18	—
Alekhora	—	—	"	"	"	0.98	—
<i>Paphos District :</i>							
Paphos	66.40	53.00	"	"	"	0.81	—
Polis... ..	—	—	"	"	"	0.61	—
<i>Kyrenia District :</i>							
Kyrenia	70.60	53.15	"	"	"	0.87	—

MAY, 1939.

<i>Nicosia District :</i>							
Nicosia	87.97	59.45	—	—	—	0.91	—
Athalassa	—	—	—	—	—	0.85	—
Morphou, C.E.F.	83.54	56.87	—	—	—	0.37	—
Makhaeras	—	—	—	—	—	0.65	—
<i>Famagusta District :</i>							
Famagusta	86.90	60.35	—	—	—	0.32	—
Akhyritou	85.32	57.87	—	—	—	0.25	—
Rizokarpaso	—	—	—	—	—	0.62	—
Lefkoniko	—	—	—	—	—	1.07	—
<i>Larnaca District :</i>							
Larnaca	83.39	56.30	0.05	1	0.05	0.32	—
Lefkara	—	—	—	—	—	0.21	—
<i>Limassol District :</i>							
Limassol	83.74	58.77	0.07	1	0.07	0.26	—
Saittas	—	—	—	—	—	1.16	—
Trikoukkia	74.51	52.77	—	—	—	1.35	—
Alekhora	—	—	—	—	—	0.49	—
<i>Paphos District :</i>							
Paphos	73.10	61.23	—	—	—	0.31	—
Polis... ..	—	—	—	—	—	0.53	—
<i>Kyrenia District :</i>							
Kyrenia	77.30	61.26	—	—	—	0.57	—

Note.—Compiled from returns furnished by Public Works Department.

Agricultural Department Publications.

THE following bulletins and leaflets have been published in English, Greek or Turkish as indicated by the letters *E.*, *G.* or *T.* after each title.

BULLETINS.

Industrial Series :

No. 1.—“The Grape and Wine Industry of Cyprus.” By M. T. Dawe, O.B.E., F.L.S. *E.*

No. 2.—“The Tanning Industry.” By M. T. Dawe, O.B.E., F.L.S. *E.*

Horticultural Series :

No. 1.—“Some Observations on the Citrus Industry of Palestine. with reference to Application of Improved Methods to the Citrus Industry of Cyprus.” By B. J. Weston, M.A., M.Sc., F.R.H.S. *E.*

No. 2.—“Picking, Grading and Packing of Citrus Fruits. A Guide for Exporters.” By B. J. Weston, M.A., M.Sc. (Agr.) *E., G. & T.*

The above two series are now combined and the following have been published :—

No. 3.—“Report on Soil Erosion in Cyprus.” By A. Pitcairn. *E., G. & T.*

No. 4.—“Summary of Agricultural Legislation in Cyprus.” *E.*

Entomological Series :

No. 1.—“Investigations into the Locust Plague in Cyprus.” By Ch. G. Pelagias, I.A. (Gx.), F.A.I. (Gx.), (also *Corrigendum*). *E.*

No. 2.—“A Survey of Olive Pests.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.* (*T.* out of print).

No. 3.—“Insect Pests and Fungus Diseases of Cyprus and their Control.” By H. M. Morris, M.Sc., F.E.S. *G. & T.* (*E.* out of print.)

No. 4.—“Injurious Insects of Cyprus.” By H. M. Morris, M.Sc., F.R.E.S. *E.*

Mycological Series :

No. 1.—“The Control of Fungus Diseases.” By R. M. Nattrass, B.Sc., Ph.D., D.I.C. *E., G. & T.* (*G.* out of print.)

“A first List of Cyprus Fungi.” By R. M. Nattrass, B. Sc. Ph.D., D.I.C. *E.*

LEAFLETS.

No. 1.—“Petroleum Emulsion.” *G.* (Out of print.)

No. 2.—“Boll Worms of Cotton.” *G.*

No. 3.—“Collection, Sorting and Packing of Oranges.” *G.* (Out of print.)

No. 4.—“The Cultivation of the Orange Tree.” *G.*

No. 5.—“Carpocapsa” *G.* (Replaced by No. 22.)

- No. 6.—“General Rules for Silkworm Rearing.” *E., G. & T.*
(Reprinted, see also No. 8, Educational Series).
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- No. 8.—“Soil Manuring.” *G.* (Out of print.)
- No. 9.—“Control Measures for Red Scale of Citrus.” *G.* (Out of print.)
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- No. 13.—“Outline of the Rat Destruction Campaign for 1930.”
G. & T. (*E.* out of print.)
- No. 14.—“Potato Tuber Moth.” *E., G. & T.* (Out of print; replaced
By No. 17).
- No. 15.—“Warble Flies.” *E., G. & T.* (*E.* out of print.)
- No. 16.—“Downy Mildew of the Vine (*Plasmopara viticola*).” *G. & T.*
(*E.* out of print.)
- No. 17.—“Potato Tuber Moth.” *E., G. & T.* (Replaces No. 14.)
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see No. 7 Educational Series.)
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(Reprinted and brought up to date.)
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E., G. & T.
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- No. 9.—“Citrus Fruit Growing in Cyprus.” *E., G. & T.*
- No. 10.—“The Breeding and Management of Sheep in Cyprus.”
E., G. & T.
- No. 11.—“Flax.” *E., G. & T.*
- No. 12.—“Diseases of Poultry.” *E., G. & T.*
- No. 13.—“Irrigation in Cyprus.” *E., G. & T.*
- No. 14.—“Cereal Crops.” *E., G. & T.*
- No. 15.—“Diseases of Sheep and Goats.” *E., G. & T.*
- No. 16.—“The Cultivation of the Carob Tree in Cyprus.” *E., G. & T.*
- No. 17.—“Table Grapes & Raisins.” *E., G. & T.*
- No. 18.—“Diseases of Cattle with Special Reference to Cyprus.”
E., G. & T.

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All communications for publication should be addressed to the Editor, *Cyprus Agricultural Journal*, Department of Agriculture Nicosia.

Contributions are invited, written on one side of the paper only. It should be understood that unaccepted manuscripts can not be returned unless postage is prepaid.

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Advertisements should be written on one side of the paper only, and should reach the Editor, *Cyprus Agricultural Journal*, not later than the 10th of the month of issue.

The "*Cyprus Agricultural Journal*" is published in March, June September and December.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors,

The Horse Breeding Law, 1930.
LIST OF STALLIONS LICENSED FOR 1939.

NICOSIA DISTRICT.			
<i>Village</i>		<i>Owner's name</i>	<i>Reg. No.</i>
Akaki	..	Michael Th. Rafti	29
do.	..	Moisis Michael Tchingi	203
do.	..	Marikkou Yorgi	240
Argaki	..	Polyvios Theophani	153
Astromeritis	..	Christoforos Evangeli	26
Kalokhorio	..	Yioryis Papaconstantinou	262
Lefka	..	Ahmet Dopran Salih	255
Lymbia	..	Andronikos Petri	32
do.	..	Heraclis Lambi	66
Morphou	..	Vasilis T. Spanos	18
do.	..	Andreas Ahapittas	249
Nicosia	..	Mehmed Kioutchouk	304
Pera	..	Yiannis G. Magou	194
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Yeri	..	Yeoryos Petri	16
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Alaminos	..	Rifat Jumaa	260
do.	..	Salih Jumaa	64
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do.	..	Lefteris Towli	225
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15th June, 1939.

ROBERT J. ROE,
Chief Veterinary Officer
Inspector of Horse Breeding.

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Livestock Officer, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Superintendent of Agriculture, Morphou.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, and Officers are stationed at Kythrea, Dheftera, Nisou, Morphou, Lefka, Pyrgos and the Nursery Garden, Nicosia.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove and Lysi Nursery Garden. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA DISTRICT.

Agricultural Assistant, Mr. C. Miltiades, is in charge including Larnaca Nursery Garden. An Officer is stationed at Skarinou.

LIMASSOL DISTRICT.

Agricultural Assistant, Mr. Kyprianides is in charge and an Officer is stationed at Agros.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Alonaris, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klokkaris, is in charge. Paphos District includes Paphos, Polis and Kelokedhara Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelokedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. A. Papa Solomontos, Agricultural Assistant,

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The Normal School, Morphon, situated on the grounds of the Central Experimental Farm.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW
OF THE
AGRICULTURE OF CYPRUS

Vol. XXXIV, Part 3. SEPTEMBER, 1939. Price 3p.

EDITORIAL NOTES.

CROP PROSPECTS.

THE production of cereal crops was very good and summer crops are doing very well. Citrus prospects are satisfactory and the carob crop is estimated to be a little better than that of last year. A good average production of grapes should be obtained and a moderate crop of olives is expected.

* * * * *

VISIT OF SOIL CONSERVATION EXPERT.

Dr. W. C. Lowdermilk, Chief of Research, Soil Conservation Service, U.S.A., visited Cyprus for ten days during August, 1939. A programme was arranged which enabled Dr. Lowdermilk to gain a representative view of the varied agricultural practices employed in Cyprus and their relation to land utilization and erosion problems. The itinerary also included visits to different types of forest formations and the measures taken to improve erosion control and catchment efficiency.

* * * * *

REFRESHER COURSE.

Mr. K. Hamboullas, Agricultural Assistant, returned on July 6th from a refresher course in deciduous and small fruit culture at the Royal Horticultural Society's Gardens at Wisley, England. During the time spent in England this officer visited the two fruit experiment stations at East Malling, in Kent, and at Long Ashton in Gloucestershire, where he made contacts with the research workers at these stations and was able to discuss various problems related to Cyprus. Visits were also paid to the John Innes Horticultural Institute, the Oaklands Farm Institute, the Kent Farm Institute, the Somerset Farm Institute, the Royal Botanic Gardens and various private nurseries. Mr. Hamboullas made arrangements while in England to take both the preliminary and final examinations for the National Diploma of Horticulture and was successful in passing both examinations.

As a result of Mr. Hamboullas' recommendations, a number of different varieties of fruit trees have been sent from England. These trees will be grown at the deciduous fruit station of the Agricultural Department at Trikoukkia in the first instance and, if successful, larger numbers will be raised for distribution to growers.

AGRICULTURAL CHEMIST.

Dr. P. A. Loizides, who was recently selected for appointment as Agricultural Chemist, arrived in Cyprus on the 24th August, 1939, and assumed duty in the Agricultural Department.

* * * * *

SCHOOL GARDEN PRIZES.

The Colony prize was awarded to Omodhos school, Limassol District, and first prizes were awarded to the following schools:—

<i>Village</i>			<i>District</i>		
Myrtou	..	..	..	Kyrenia	
Yialousa	..	..	..	Famagusta	
Kythrea	..	..	..	Nicosia.	
* * *				* * *	

STOMATITIS OF SHEEP.

In many parts of the Island there exists at present a disease among sheep, the main symptoms of which are swelling of the lips and tongue, mouth hot and painful to the touch and in some cases the edges of the lips bleed easily; small holes may be present containing pus due to maggot infection.

Affected animals are feverish, sometimes stiff and not able to walk freely and on account of the inflammation of the mouth they are not able to take their usual food. Usually there is nasal discharge and sticky saliva dribbling from the lips.

The whole flock does not become affected and most of them recover unless they are not properly looked after.

The real cause of the disease has not yet been identified but it is under investigation. It appears, however, to be of a very mild nature and if proper care is taken, very few deaths may occur among the infected animals.

The following treatment is recommended:—

Isolation of affected sheep in a well-protected yard or mandra.

Give them bran-mash or ground oats and green (a little dry) food.

150 drams of vinegar, one table spoonful of salt and one oke of water will make a good mouth wash.

A table spoonful of borax or boracic acid mixed with 100 drams of bee-honey or carob-honey is a good mixture; a table spoonful from this mixture to be given three times daily to each affected animal.

* * * * *

LIVESTOCK NOTES.

The Crossbred Dairy Cow No. 321, which has just completed her 6th lactation, has exceeded her previous record yield milk by giving 13,442 lb. (or 4,800 okes) in 348 days. In her 6 lactations she has given a total of 30 tons of milk (=24,000 okes) which is equal to 50 times her own weight. This is not to be compared with English or American records which far exceed anything possible in Cyprus, but it is nevertheless an achievement worth noting. The cow No. 321 is by a Friesian bull out of a Dairy Shorthorn cow, and was born at the Stock Farm on 19th October, 1930,

EXPORT OF LIVESTOCK.

The export figures for the first six months of the year show an increase in the number of horses, mules and cattle exported as compared with the figures for 1938, as follows :—

	1938	1939
Horses	18	34
Mules	438	654
Donkeys	266	268
Cattle	698	800
Sheep	249	164
Goats	46	32
Pigs	40	43
Camels	27	42

The majority of the cattle and mules were exported to Palestine and of the donkeys to Greece.

An Analysis of Farming Costs in Cyprus.

BY H. M. JAMES, DIP. AGR. (I.C.T.A.), *Superintendent of Agriculture*,
AND

CH. C. KOUMIDES, C.D.A. (Reading), *Agricultural Officer*.
[Continued from the June issue.]

II. THE COST OF LAND.

Land values in Cyprus are affected by the following factors :—

1. Fertility.
2. The availability of flood waters for winter irrigations, or water for summer irrigations from chains of wells, or complete irrigation installations on the property.
3. The locality, road communications and nearness to markets.
4. Trees growing on the land.

Agricultural land in Cyprus is split up into a great number of small plots belonging to different owners. It is often difficult to purchase a large area of land for this reason. Purchase of land should be undertaken with great care, especially with regard to ancient rights-of-way and water channels.

A valuation of all the land of the Island was carried out for the purposes of taxation during the period 1909–1929. A proportion of the valuations given in this survey have altered in recent years and the only index to present values are recent sales which, however, are often influenced by personal factors. However, the following figures for the values of lands in various localities and of various conditions may be of interest, but they should be accepted with caution.

(A) Market Values of Land in various Typical Villages.

1. *Morphou*.—Large village on the plains near the western end of Cyprus. Situated on a main road, 24 miles from Nicosia. The land is, on the whole, fertile and good crops of cereals are grown. Certain localities are suited to potatoes, beans and most of the field crops of the Island. Flood waters are usually available during winter, but the rainfall is the lowest in Cyprus.

The value of good land with flood waters available is £5 to £8 per donum. The Central Experimental Farm (780 donums of fair agricultural land with flood waters available) was purchased at the assessed value of £5 per donum,

2. *Athienou*.—A large village towards the eastern end of the plains connected by second class roads to Larnaca and Nicosia, both about 12 miles away. Flood waters are not as a rule available, but the soil is deep and fertile. Cereals are the main crop of the village.

Land Values: Good agricultural land £8 to £12 per donum.

Fairly good agricultural land £4 to £7 per donum.

Fair agricultural land £2 to £3 per donum.

3. *Lefkoniko*.—A large village well situated on the main Nicosia to Famagusta road and about 24 miles distant from each town. Large quantities of flood waters are usually available for winter cereals. First class agricultural land with facilities for flooding is worth between £10 and £15 per donum.

4. *Prastio*.—A large village as well situated as Lefkoniko, but without equally good facilities for flooding. Good agricultural land is worth £3-£4.

5. *Loutros*.—A small village in the Tilliria district near the west coast of Cyprus, badly situated, far from markets.

Agricultural land is worth £1. 10s. to £5 per donum.

(B) *Values of Land in and near Typical Towns.*

1. *Limassol*.—A busy port with about 16,000 inhabitants. Land suitable for or planted with citrus trees is taken as a suitable index of land values.

Citrus Land.

Position	Unplanted	Planted	
		Trees 1-5 years	Trees over 5 years
* Within 1 mile of Limassol harbour	per don. £100	per don. £150	per don. £200
„ 1-3 miles „ „	£10-£50	—	£60-£150
„ 4-10 „ „ „	£2-£8	£50	£80

* These high values are due to the potential value of the land as building sites.

2. *Famagusta*.—A busy port with harbour for small ships. About 9,000 inhabitants.

Famagusta Citrus Land (Unplanted).

Quarter	Distance from Harbour	Value per donum
		£
Varosha	Within 1½ miles	45
	Beyond 1½ miles	25
Kato Varosha	Within 1½ miles	40
	Beyond 1½ miles	20
Ayios Memnon	Within 2½ miles	30
	Beyond 2½ miles	10
Ayios Loukas	Within 2½ miles	30
	Beyond 2½ miles	10

Land in or near Famagusta with citrus trees planted has been sold in recent years as follows:—

5 years old plantations £30-£40 per donum.

Over 4 years old plantations £40-£100 per donum.

Another example of the increased value of land after tree planting may be given by a case where land near Larnaca purchased 18 years ago at £2 per donum is now fully planted with olive trees between 15 and 17 years old and is estimated to be worth £20 per donum.

As a guide to the cost of land in villages on the plains the following list of items has been prepared :—

Basic value of 1st class land	£6 per donum.
Basic value of 2nd class land	£4 per donum.
Basic value of 3rd class land	£2 per donum.
Value of facilities for flood irrigation in winter	£1 per donum.
Value of facilities provided by nearness to asphalt road	£1 per donum.
Value of situation being within :	
10 miles of market	£5 per donum.
15 miles of market	£3 per donum.
20 miles of market	£1 per donum.

For example the value of a donum of second class land with facilities for flood irrigation at a village on the main road within 15 miles of a large own would be £9.

The following list of items may be of assistance in computing the cost of high priced land in and near large ports :—

	<i>Per donum</i>
	£
Basic value of 1st class land	12
Basic value of 2nd class land	8
Basic value of 3rd class land	4
Value of nearness to asphalt road	1
Value of situation within :	
1 mile of harbour	40
2 miles of harbour	30
3 miles of harbour	20
4 miles of harbour	10
Value of complete irrigation installation in good condition	10
Value of citrus trees 1 year old planted on the land	20
Value of citrus trees between 2 and 7 years, inclusive	10 <i>per year</i> .

For example, a completely equipped citrus grove, near a main road, within three miles of the harbour of a large town and fully planted with 5 years old trees would be priced at between £95 and £113 per donum, depending on the fertility of the land.

The two lists given above and the previous figures are only intended as very rough guides to the prices that have to be paid in Cyprus for land of various categories. Each sale will be governed by different circumstances and by a different personal element, but a study of the prices quoted may enable the purchaser to have a clearer idea of the probable cost of the land he requires.

It may be unnecessary to mention that the value of land has a great influence on the crops to be grown; for instance it would never be profitable to grow a crop like wheat, of which the maximum gross value of the produce is £3, on land that cost £30-£40 per donum.

12. OVERHEAD COSTS.

Overhead costs are those which cannot be debited to any individual item or crop, but must be divided and charged proportionally to all crops that are grown on the farm. Included in overhead costs are miscellaneous expenditure, certain salaries and the interest and depreciation of capital invested in the farm that cannot be accounted for elsewhere. For example, buildings must be charged against overhead cost, but the threshing machine is only charged against cereal crops actually threshed.

In this section, the overhead costs at the central experimental farm are calculated on the basis of 600 donums of land, which are run to a certain extent on the lines of a commercial farm. Many expensive items and a large part of the land is omitted from these calculations in order that unusual items of expenditure, such as those caused by experimentation, may be omitted. The overhead costs calculated in this way should enable an amount approaching that incurred in commercial farming to be charged to the various crops, the costings of which are discussed in the next section.

The capital that is to be debited against overhead costs, described above, is listed below. Various items, including the complete irrigation installation, tractor, thresher, sheep-fold and pig sties are not included in the list for the reasons just stated.

Capital Expenditure debited to Overhead Costs.

	£
Land : 600 donums @ £5 per donum	3,000
Buildings : Store rooms	240
Stables	230
Sheds	240
Rooms for groom and foreman	70
	780
Fencing : 11,800 feet including gates	270
Roads	150
Implements and machinery	1,000
Manure pits (3 concreted and covered)	100
Total standing capital	5,300
Floating capital (for fodder, labour, etc., per annum)	500
Total capital chargeable to overhead costs	<u>£5,800</u>

The total overhead costs per annum may now be calculated as follows :—

	£
1. Interest on capital (£5,800 @ 3%)	174
2. Depreciation and repairs :	
Buildings and fencing (1,050 @ 3%)	31
Roads (£150 @ 10%)	15
Implements (£1,000 @ 5%)	50
3. Wages :	
Foreman and storekeeper @ £60 each	120
4. Miscellaneous expenditure	50
Total	<u>£440</u>

Thus, £440 must be divided equally amongst 600 dons. of crops. If this division is done, it is seen that overhead costs to the value of 11p. per donum per month must be charged to each crop for the time it occupies the land, not only during the period of growth, but also during the period of preparation.

In the calculations that follow, overhead costs are charged at 11p. per donum per month. For example, when wheat is grown following a fallow, the land is utilized for 24 months to produce one crop. Wheat after fallow is, therefore, charged with overhead costs for 24 months whereas wheat after vetches is only charged with overhead costs for 12 months. Some readers may consider 11p. per donum per month to be either too large or too small an amount, but in this case it should be simple to effect the necessary alterations in values to suit their own beliefs.

13. THE COST OF RAISING VARIOUS ANNUAL CROPS, THE VALUE OF THE PRODUCE AND SUGGESTED PROFITS AND LOSSES.

In previous sections, the costs of various farming operations, wages, etc., have been discussed. These costs are now debited to various crops to calculate the cost per donum for production. The yields given are those expected in an average year at the Central Experimental Farm and are based on records of yields actually obtained during the past eight years. Only crops that have been grown on the farm are discussed and it is realized that there are very many other crops that are worthy of inclusion, but it is believed that the crops chosen are reasonably representative. The prices quoted for various products are the estimated average prices during recent years and are subject to wide fluctuations.

Cyprus crops can usually be classified as winter or summer crops. Winter crops are those which make use of the rain from October to March whereas summer crops rely almost wholly on artificial irrigation. Peasant agriculture depends mainly on winter crops as the capital for irrigation systems is lacking. Yields of winter crops are somewhat low compared with similar crops grown elsewhere. The prices for winter crops are kept low for two reasons: firstly, the cost of production by a peasant and his family is often lower than when the crops are grown on a capitalized farm, and secondly, owing to the low yields, there is competition from imported produce from countries where yields are higher, quality is better and cost of production is as low. It is believed that, except in isolated cases, good profits will not be made on a modern farm from winter crops alone.

The produce of summer crops, on the other hand, is comparatively scarce and high priced. A man with sufficient capital to develop irrigation water should find the expenditure more than repaid by valuable crops.

Overhead costs on a capitalized farm are of great importance and it is essential to employ a rotation which utilizes the land to its fullest extent. Although theoretically it is possible to raise two crops a year, in practice it is often not possible to grow more than one crop a year or sometimes one crop in two years owing to the general poverty of Cyprus soils. Suitable rotations must be worked out in each case separately. The crops that follow are divided into the following groups for convenience:—

Group 1: Cereals: wheat, barley, oats.

Group 2: Winter legumes: vicos *Vicia sativa*, vetches *Vicia ervilia*, louvana *Lathyrus ochrus*, broad beans *Vicia faba*.

Group 3: Non-leguminous summer crops: cotton.

Group 4: Leguminous summer crops: cowpeas, haricot beans.

Group 5: Root crops: potatoes, colokasia.

Many crops are preceded by a bare fallow of long or short duration. The expenses incurred per donum on these fallows are shown below :—

Ploughed Fallows.

		s.	p.	s.	p.
May 1st to October 30th (6 months) :					
1 tractor ploughing	..	1	5½		
6 months overhead costs @ 11p. per month ..	..	7	3		
Total (May–October)	..			8	8½
November 1st to April 31st :					
1 deep ploughing with animals	..	2	8		
1 spring harrowing	..	—	3½		
6 months overhead costs @ 11p. per month ..	..	7	3		
Total (November–April)	..			10	5½
Total for 12 months	..			19	5

Another method of preparing the land is a green manure, the cost of which per donum is as follows :—

Green Manure.

		s.	p.
Ploughing with 2-furrow plough	..	1	4
Value of seed (4 okes vicos @ 2p. per oke) ..	..	—	8
Broadcasting seed	..	—	1
Harrowing (spring-time harrow)	..	—	3½
Cross harrowing (zigzag harrow)	..	—	2
Rolling	..	—	1
Ploughing in at green stage	..	2	8
Flooding to cause decomposition	..	5	0
6 months overhead costs (if followed by summer crop) ..	..	7	3
Total (if followed by summer crop)	..	18	3½
Add 6 months overhead costs (if followed by winter crop)	..	7	3
Total (if followed by winter crop)	..	25	6½

GROUP I.—CEREALS.

The cost of production of wheat, barley and oats during the period the crops are on the land is given below :—

Cost of Production of Cereals.

Operation	Cost					
	Wheat		Barley		Oats	
	s.	p.	s.	p.	s.	p.
Ploughing with 2-furrow plough ..	1	4	1	4	1	4
Value of seed	3	1	1	4½	1	6
Broadcasting	—	1	—	1	—	1
Value of basic dose of artificial manure	4	0	3	6	—	—
Distribution of fertilizer	—	1	—	1	—	1
Harrowing with spring-time harrow	—	3½	—	3½	—	3½
Cross harrowing with zigzag harrow	—	2	—	2	—	2
Rolling	—	1	—	1	—	1
One irrigation	5	2½	5	2½	5	2½
Harvesting with binder	1	3	1	3	1	3
Overhead charges for 6 months ..	7	3	7	3	7	3
Total	23	4	21	4½	18	0

Value of straw : wheat 2s. per 50 okes, barley and oats 1s. 3p. per 50 okes.

<i>Value of Grain</i>	<i>Wheat</i>	<i>Barley</i>	<i>Oats</i>
	<i>s. p.</i>	<i>s. p.</i>	<i>s. p.</i>
Price of grain per kilé (average) ..	5 0	2 3	1 6
Cost of threshing per kilé	— 3½	— 2½	— 2
Value of grain per kilé <i>less</i> threshing charges	4 5¾	2 0½	1 4

Average Yields, etc., obtained at Central Experimental Farm.

- (1) Following leguminous or well-manured non-leguminous summer crops.

	<i>Grain</i> (kilé)	<i>Straw</i> (loads)	<i>Total Value</i>	<i>Profit or Loss</i>
			<i>s. p.</i>	<i>s. p.</i>
Wheat .. 6 ..	2½	.. 32	7½	Profit 9 3½
Barley .. 11 ..	2½	.. 25	6	„ 4 1½
Oats .. 13 ..	2½	.. 22	1	„ 4 1

- (2) Following moderately manured non-leguminous summer crops :—

Wheat .. 5 ..	2	.. 27	2	Profit 3 7
Barley .. 9 ..	2	.. 20	8	Loss — 6½
Oats .. 11 ..	2	.. 17	5	Loss — 6

- (3) After winter cereals, following 6 months' fallow.

Total cost of production (including fallow) : barley 30s. 4p., oats 30s. 5½p.

Barley .. 12 ..	2	.. 27	0	Loss 3 4
Oats .. 14 ..	2	.. 22	8	Loss 7 6½

- (4) After summer crops, following 12 months' fallow.

Total cost of production (including fallow) : wheat 43s. 4p.

Wheat .. 8 ..	2½	.. 42	1	Loss 1 3
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- (5) After winter cereals, following 18 months' fallow.

Total cost of production (including fallow) : wheat 51s. 8½p.

Wheat .. 9 ..	3	.. 47	7	Loss 4 1½
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- (6) After winter legumes, following 6 months' fallow.

Total cost of production (including fallow) : wheat 32s. 3½p.

Wheat .. 8 ..	2½	.. 42	1	Profit 9 6½
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The figures above may give some idea of the profits and losses to be expected when growing wheat at the Central Experimental Farm. It should be noticed that, where overhead costs are a consideration, long fallows are often unprofitable although they may be an essential item in peasant farming. The yields above are only valid when the land is in good heart when the crop preceding cereals is grown.

GROUP 2.—WINTER LEGUMES.

Three winter leguminous crops grown as a rule without irrigation are louvana, vicos and vetches. The two former are usually sown around December and the latter, which is by far the most important, in March,

Cost of Production. (After well-fertilized Summer Crops).

Operation	Vetches		Vicos		Louvana	
	s.	p.	s.	p.	s.	p.
Ploughing with 2-furrow plough ..	1	4	1	4	1	4
Value of seed	—	8	1	3	1	3
Broadcasting	—	1	—	1	—	1
Harrowing with spring-time harrow	—	3½	—	3½	—	3½
Cross harrowing with zigzag harrow	—	2	—	2	—	2
Rolling	—	1	—	1	—	1
Harvesting	—	4	—	5	—	6
Threshing	—	4½	—	4½	—	4½
Overhead charges for 6 months ..	7	3	7	3	7	3
Total	11	4	12	0	12	1

Receipts.

Crop	Value of Produce		Average Yields		Total value		Profit	
	Seed	Straw	Seed	Straw				
	per oke	per load	okes	load	s.	p.	s.	p.
Vetches ..	2p.	5s.	70	0½	18	0½	6	5½
Vicos ..	2p.	3s.	85	0½	20	3½	8	3½
Louvana ..	2p.	1s.	100	0½	22	6½	10	5½

In other Districts of Cyprus, higher yields are recorded owing to the heavier rainfall. The higher yield of louvana compared with the other two crops is not necessarily maintained elsewhere. Vicos is the best crop for hay mixtures.

Another important winter legume, which, however, usually needs two irrigations, is broad-beans.

Cost of Production of Broad Beans. (After well-fertilized Summer Crops.)

Operation	Cost	
	s.	p.
Ploughing with 2-furrow plough	1	4
Value of manure (1 bag.O.12.6)	8	0
Distribution of fertilizer	—	1
Ridging with 3-furrow ridger	1	1
Value of seed (20 okes @ 2p.)	4	4
Planting on ridges (4 women-days @ 7p.)	3	1
Hoeing (4 women-days @ 7p.)	3	1
2 irrigations @ 3s. 5p. each	7	1
Harvesting, threshing and cleaning	2	0
Overhead charges for 6 months	7	3
Total	37	7

Receipts.

Crop	Price per oke	Average yield	Total value	Profit
Broad beans ..	2p.	200 okes	44s. 4p.	6s. 6p.

GROUP 3.—NON-LEGUMINOUS SUMMER CROPS.

One of the more important summer crops in Cyprus is cotton, despite its present low value. The following example shows the cost of production, ginning, baling, exporting and marketing of a small consignment of cotton. It has been found very important, at the Central Experimental Farm,

to plant cotton during April, both from the value of considerably higher yields and ease in cultivation. The cotton crop in the example has, therefore, been grown following summer crops harvested in the previous November. Twelve months overhead charges are charged.

Cotton (after Summer Crops.)—Cost of Production.

Operation	Cost
	s. p.
Winter ploughing, mules	2 8
Spring ploughing with 2-furrow plough	1 4
Ridging with 3-furrow ridges	1 1
Finishing off ridges by hand (2 women-days)	1 3
Planting (2 women-days)	1 3
Value of seed	- 6
Thinning (2 women-days)	1 3
Value of artificial manure (60 okes 4.10.5.)	8 0
Application of artificial manure ($\frac{1}{2}$ woman-day)	- 3
1st hoeing and weeding (3 women @ 7p.)	2 3
2nd hoeing and weeding (4 women @ 7p.)	3 1
8 irrigations @ 3s. 5p. each	28 4
Picking (12 women-days @ 6p.)	8 0
Removal of stalks ($\frac{1}{2}$ woman-day)	- 3
Overhead costs for 12 months	14 6
Total	75 3

Production :

150 okes 1st quality seed cotton.

30 okes 2nd quality seed cotton.

Cost of ginning @ $1\frac{1}{2}$ p. per oke of lint : 10s.

Products after ginning :—

50 okes 1st quality cotton lint for export.

For local disposal :—

	s. p.
10 okes 2nd quality cotton lint @ 7p. per oke	7 7
100 okes 1st quality cotton seed @ $1\frac{1}{2}$ p. per oke	16 6
20 okes 2nd quality cotton seed @ $0\frac{1}{2}$ p. per oke	1 1

Total receipts from locally disposed products .. 25 5

50 okes 1st quality cotton lint for export, cost of placing on Liverpool market:—

Baling @ 6s. per bale of 150 okes (including canvas, etc.)	2s.
Transport to ship and charges in Cyprus	1s.
Transport to Liverpool @ £3. 2s. 6p. per ton	4s.
Charges in England including brokerage @ 1%	2s.

Total 9s.

Value of 50 okes (140 lbs.) cotton lint @ 8d. per lb. = £4. 13s. 3p.

BALANCE SHEET (COTTON PER DONUM).

<i>Expenditure.</i>	£ s. p.	<i>Receipts.</i>	£ s. p.
Production of seed cotton	3 15 3	Locally disposed produce	1 5 5
Ginning	- 10 0	Exported lint	4 13 3
Costs of exporting lint	- 9 0		
Profit	1 4 5		
	<u>£5 18 8</u>		<u>£5 18 8</u>

Variation of 1d. per lb. in the price of lint mean a difference in profit of 11s. 6p. per donum,

GROUP 4.—LEGUMINOUS SUMMER CROPS.

The two main leguminous summer crops are cowpeas (*Vigna catjang*) and haricot beans (*Phaseolus vulgaris*). The water requirements of both are comparatively low. Haricot beans are planted in August and can, therefore, follow the cereal crop of the same year, but cowpeas must be planted in May and usually follow the summer crops of the previous year.

(a) *Haricot Beans*.—Cost of Production per Donum (following Cereals).

Operation	Cost	
	s.	p.
June ploughing of cereal stubbles (tractor)	1	5½
Flooding in July	5	0
Second ploughing (mules)	2	8
Flooding in August	5	0
Value of fertilizer (1 bag of 6.8.8)	14	0
Distribution of fertilizer	—	1
Value of seed (8 okes @ 5p.)	4	4
Sowing in drills (1 man, 2 mules, 1 woman—2 donums daily)	3	2
Hoeing (4 women @ 7p.)	3	1
3 irrigations @ 4s. each	12	0
Picking (8 women @ 6p.)	5	3
Cleaning, etc. (2 women @ 6p.)	1	3
Overhead costs (6 months)	7	3
Total	65	3½

Crop	Price per oke	Average yield	Total value	Profit
Haricot beans ..	5p.	160 okes ..	£4. 8s. 8p. ..	£1. 3s. 4½p.

(b) *Cowpeas*.—Cost of Production per Donum (after Summer Crops).

Operation	Cost	
	s.	p.
Winter ploughing (mules)	2	8
Spring ploughing with 2-furrow plough	1	4
Flooding	5	0
Value of fertilizer (1 bag of 6.8.8.)	14	0
Distribution of fertilizer	—	1
Value of seed (3 okes @ 6p.)	2	0
Sowing in drills (1 man, 2 mules, 1 woman—2 donums daily)	3	2
Hoeing (4 women @ 7p.)	3	1
3 irrigations @ 4s. each	12	0
Picking (5 women @ 6p.)	3	3
Cleaning, etc. (1½ women-days)	1	0
Overhead costs for 12 months	14	6
Total	62	7

<i>Crop</i>	<i>Price per oke</i>	<i>Average yield</i>	<i>Total value</i>	<i>Profit.</i>
<i>Cowpeas</i> ..	6p. ..	120 okes ..	£4 ..	17s. 2p.

Experiments are proceeding with soya beans, which may prove to be another useful summer crop, but, up to the present, yields have not been sufficiently high.

GROUP 5.—ROOT-CROPS.

The main root-crops of Cyprus are the summer and winter crops of potatoes. The latter costs more to produce and is also more productive. The summer crop, planted about February, can follow the summer crops of the previous year and the winter crop, planted in August, usually follows the winter crops harvested in May–June.

Potatoes.—Cost of Production per Donum.

<i>Operation</i>	<i>Summer Crop</i>			<i>Winter Crop</i>		
Preliminary cultivation :—						
(a) Summer crop :						
Winter ploughing, mules ..	£	s.	p.	£	s.	p.
Spring ploughing, 2-furrow plough ..	—	2	8	—	—	—
(b) Winter crop :						
1st ploughing in June, tractor ..	—	—	—	—	1	5½
1st flooding in July ..	—	—	—	—	5	0
2nd ploughing in July ..	—	—	—	—	2	8
2nd flooding in August ..	—	—	—	—	5	0
3rd ploughing with 2-furrow plough ..	—	—	—	—	1	4
Subsequent cultivation : Summer and Winter Crops : —						
Value of manure and fertilizer :						
2 tons of F.Y.M. @ 16s. per ton ..	1	12	2	1	12	0
1 bag 6.8.8. (or other) @ 14s. ..	—	14	0	—	14	0
Application of manures and fertilizers ..	—	4	0	—	4	0
Ridging with 3-furrow ridger ..	—	1	1	—	1	1
Value of seed :						
200 okes of Irish seed @ 2p. per oke ..	—	—	—	2	4	4
200 okes of once grown seed @ 1p. per oke ..	1	2	2	—	—	—
Planting, 3 women-days @ 7p. ..	—	2	3	—	2	3
Hoeing, twice, 8 women @ 7p. ..	—	6	2	—	6	2
3 irrigations @ 4s. each ..	—	12	0	—	12	0
Lifting : 1 man, 2 animals, 4 women ..	—	6	0	—	6	0
Overhead costs ..	—	14	6	—	7	3
Total ..	£5	18	8	£7	5	3½

Yields of Potatoes.

<i>Crop</i>	<i>Average Yield</i>	<i>Average Price</i>	<i>Total Value</i>	<i>Profit</i>
	<i>okes</i>		<i>£ s. p.</i>	<i>£ s. p.</i>
Summer crop ..	1,200 ..	1p. per oke ..	6 13 3 ..	— 14 4
Winter crop ..	1,600 ..	1p. per oke ..	8 17 7 ..	1 12 3½

(b) KOLOKASS.

Kolokass or Colocasia is another very profitable root crop, but its water requirements are very high.

Cost of raising one Donum Kolokass.

<i>Expenses.</i>		<i>Receipts.</i>	
	£ s. p.		£ s. p.
One ploughing in autumn	— 2 8	2,000 kolokass @ 1½p.	
One ploughing in spring	— 2 8	per oke	16 13 3
One cross ploughing in spring	— 1 4	800 okes seed @ 2p.	
Manuring : 150 loads @ 1s. each (only ½ charged to this crop	2 10 0	per oke	8 17 7
One harrowing	— — 3		
Ridging : 1 animal @ 1s. and 6 men @ 2s. . . .	— 13 0		
Seed : 400 okes @ 2½p.	5 11 1		
Planting : 2 men @ 3s. and 1 woman @ 7p. . .	— 6 7		
1st hoeing and earthing, 6 men @ 2s.	— 12 0		
2nd hoeing and earthing 10 men @ 2s.	1 0 0		
46 irrigations (av. 75 tons of water each) @ 2s. 3p.	5 6 2		
Lifting and cleaning : 50 women @ 7p. and 8 men @ 2s.	2 14 8		
Overhead costs for 12 months	— 14 6		
	£20 6 2		
Profit	5 4 8		
	£25 11 1		£25 11 1

14. THE COST OF RAISING TYPICAL PERENNIAL CROPS (ORANGES AND ALMONDS), THE VALUE OF THE PRODUCE AND SUGGESTED PROFITS.

Up to this section, the paper has dealt almost exclusively with costs that have been kept by the authors and can be personally vouched for. Unfortunately, as yet, no perennial crop has been grown at the Central Experimental Farm and the costings of the two crops described in this section are in the nature of estimates. Many leading Cyprus farmers and several officers in the Agricultural Department have assisted in compiling the returns that follow. At first it had been the intention of the authors to take *in toto* the cost accounts of specific plantations, but in practice it was found to be very difficult to obtain the figures for the typical plantations as required. In consequence, the following figures while, so to speak, based on fact, refer to imaginary plantations run efficiently and well situated. In particular, it is with the utmost diffidence that the figures for the citrus grove are given, but every effort has been made to ensure that a reasonably average and accurate account is presented.

1. ORANGE GROVE (50 DONUMS).

Orange growing needs a large amount of capital outlay on land, irrigation installations, etc., and also a large amount of capital in hand to pay for expenses until sales of fruit cover these.

The capital necessary for a 50-donum orange grove in the main orange growing District of Famagusta is estimated as follows:—

<i>Standing Capital.</i>		£
Land (50 donums @ £20 per donum)	..	1,000
Irrigation engine and pump (40 tons per hour) ..	..	160
Installation including well-boring and engine shed ..	..	100
Concrete storage tank	..	100
Underground irrigation channels (4,500 ft.) ..	..	150
Fencing. Iron material (3,500 ft.) including gates ..	..	90
Tool shed	..	20
Tools and implements	..	100
4,000 grafted trees @ 1s. each	..	200
Contingencies. Including roads	..	80
Total Standing Capital		£2,000
<i>Floating Capital.</i>		
£5 per donum for 6 years	..	1,500
Total Capital		£3,500

From this estimated capital expenditure, the overhead costs are estimated as follows:—

<i>Overhead Costs.</i>		£
Interest on capital £3,500 @ 3%	..	105
Depreciation and repairs:	£	
1. Building, fencing, concrete £490 @ 3% ..	14	
2. Engine and pump, £160 @ 15% ..	24	
3. Roads £50 @ 10%	5	
4. Implements £100 @ 5%	5	
Wages:		48
Foreman—Mechanic	..	60
Miscellaneous expenditure	..	12
Total Overhead Costs for 50 donums		£225

(Overhead costs per donum per annum=£4.10s.)

The establishment and maintenance figures year by year are as follows: All animal labour is hired when necessary.

<i>Year 1.—Establishment of Grove. (50 donums.)</i>		£
Clearing land and deep cultivation @ £1 per donum ..	..	50
Laying out and opening holes	..	20
Planting wind-breaks and hedges	..	30
Overhead costs	..	225
Total		£325

(Cost per donum £6. 10s.)

Year 2.—Maintenance of Grove. (50 donums.)

	£
Transport, planting and staking @ 4½p. per tree ..	100
Manure and manuring @ £1 per donum	50
One deep hand cultivation @ £1 per donum	50
3 cultivations including making of basins and weedings	25
Wages of labourer irrigating for 6 months	15
Fuel for engine	15
Overhead costs	225
Total	£480

(Cost per donum £9. 12s.)

Year 3.—Maintenance of Grove. (50 donums.)

	£
Manure and manuring	50
Cultivations (4–5 by hand or animal)	75
Wages of labourer for irrigating	15
Fuel for engine	15
Spraying (including wages and cost of spray) ..	20
Pruning, replacement of stakes if necessary, etc. ..	10
Overhead costs	225
Total	£410

(Cost per donum £8. 4s.)

Year 4.

Total cost of maintenance (50 donums)	£450
(Cost per donum £9.)	

Year 5 and Subsequent Years.

Total cost of maintenance (50 donums)	£475
(Cost per donum £9. 10s.)	

Receipts from Produce.—The orange grove under discussion is taken as being on good soil and to have been well manured, cultivated and irrigated. The yields quoted are, therefore, fairly high. The price of £1 per 1,000 is about the average received in the past few years. Owing to the uneven bearing year by year in orange groves, estimated averages in 4 year-periods are quoted :—

Receipts from 50-donum Orange Grove.

Year	Average No. of fruit per donum per annum	Value per donum per annum at £1 per 1000	Average maintenance costs per donum per	Average loss per donum per annum	Average profit per donum per annum
		£	£ s. p.	£ s. p.	£ s. p.
1–4	Nil	Nil	8 6 4½	8 6 4½	—
5–8	5,000	5	9 10 0	4 10 0	—
9–12	14,000	14	9 10 0	—	4 10 0
13–16	16,000	16	9 10 0	—	6 10 0

It is estimated that after 18 years all of the early years establishment and maintenance costs will have been paid off and that the average profit per donum should be £6. 10s. or £325 for a 50-donum grove.

The value of the grove when fully bearing would be worth between £100 and £120 per donum or £5,000—£6,000 in all.

Exportation of Oranges.—Oranges in Cyprus are mainly exported to England and Scandinavian countries. It may be of interest to give an estimate of the cost of placing a case of oranges on the English market. The cost of production of oranges per 1,000, calculated from the preceding figures, works out at approximately 13s. An average of $6\frac{1}{2}$ cases are filled from 1,000 oranges.

Cost of placing a Case of Oranges on English Market.

	s.	p.
Cost of production of fruit, including picking	2	0
Packing and handling in Cyprus	2	$4\frac{1}{2}$
Freight to England	2	0
Brokerage and charges in England	2	0
Total Cost	8	$4\frac{1}{2}$

If the oranges are not produced by the exporter, but are purchased at 20s. per 1,000, the cost of fruit is 3s. per case and the total cost per case is 9s. $4\frac{1}{2}$ p.

2. ALMOND PLANTATION (50 DONUMS).

Almond plantations are being extended over large areas owing to the comparatively low cost of maintenance, the low water requirements of the tree and the high value of the produce.

The capital necessary for a 50-donum plantation of almonds is estimated as follows:—

	£
<i>Standing Capital.</i>	
Land. 50 donums @ £5 per donum	250
Engine and pump (20 tons per hour)	70
Installation including well-boring and shed	60
Concrete storage tank	50
Concrete channels	50
Fencing	90
Tool-shed	20
Tools and implements	50
2,000 grafted trees @ $4\frac{1}{2}$ p. each	50
Roads and contingencies	60
Total standing capital	£750

<i>Floating Capital.</i>	
£2 per donum for 10 years	1,000
Total Capital	£1,750

From this capital expenditure, overhead costs are estimated as follows :—

	<i>Overhead Costs.</i>	£	s.	p.
1. Interest on capital, £1,750 @ 3%		52	10	0
2. Depreciation :				
Engine and pump, £70 @ 20%		14	0	0
Buildings, fencing, concrete, £280 @ 3%		8	10	0
Implements, £50 @ 5%		2	10	0
Roads, £50 @ 10%		5	0	0
3. Wages for Foreman (performing duties of Mechanic and Irrigator)		60	0	0
4. Miscellaneous expenditure		7	10	0
Total overhead cost for 50 donums		£150	0	0

Overhead costs per donum per annum £3.

Almond trees, well looked after, come into full bearing after about the 10th year from planting.

The cost of establishment and maintenance of a 50-donums plantation for the first 10 years is as follows :—

Establishment and Maintenance for First 10 Years (50 Donums).

	£
Clearing and deep cultivation (<i>@</i> £1 per donum	50
Laying out, opening holes, planting and staking (<i>@</i> 4½ <i>p.</i> per tree	50
5-annual cultivations per annum (<i>@</i> 3 <i>s.</i> per donum each ..	375
5-hand cultivations per annum (<i>@</i> 2 <i>s.</i> per donum each ..	250
Fuel for engine average £7 per annum	70
Value of manure, average 5 <i>s.</i> per donum per annum ..	125
Miscellaneous costs (including pruning and harvesting) ..	30
Overhead costs (<i>@</i> £3 per donum per annum	1,500
Total	£2,450

Total establishment and maintenance cost per donum for the first 10 years is, therefore, £49.

After the 10th year, annual expenses are as follows :—

Maintenance Expenses, 11th Year and after.

	£
Cultivations (4-5) £1 per donum	50
Fuel for engine	10
Pruning 2 <i>s.</i> per donum	5
Value of manure (24 <i>s.</i> per donum every 4th year) ..	15
Collecting and cleaning of fruit (<i>@</i> 12 <i>s.</i> per donum ..	30
Miscellaneous costs	15
Overhead costs	150
Total	£275

Total maintenance cost per donum for the 11th and subsequent years is, therefore, £5. 10*s.*

Receipts from Produce.

The almond plantation under discussion has been well cultivated and manured. The yields quoted are somewhat above average. It is often possible to obtain higher prices than $4\frac{1}{2}p.$ per oke, but this is about the average obtained during recent years.

Receipts from 50 Donums Almond Plantation.

Year.	Average weight of almonds per donum per annum.	Value per donum per annum @ $4\frac{1}{2}p.$ per oke.	Average maintenance costs per donum per annum.	Average loss per donum per annum.	Average profit per donum per annum.
—	—	—	—	—	—
1- 5	Nil	Nil	£ s. p. 4 18 0	£ s. p. 4 18 0	£ s. p. — — —
5-10	200 okes	£5	4 18 0	—	— 2 0
11-15	440 okes	£11	5 10 0	—	5 10 0

After the 15th year, the early years establishment and maintenance expenses will have been paid off and a profit of £5. 10s. per donum is expected. For the whole grove of 50 donums, this will be an average profit of £275 per annum.



Central Experimental Farm showing office, storeroom and covered manure pits.

15. THE COST AND VALUE OF SUPPLEMENTARY LIVESTOCK.

On the average farm there is a certain amount of waste and other by-products that can best be utilized by feeding to animals. At the Central Experimental Farm, the following livestock are kept apart from working animals :—

A flock of sheep (60-70 ewes).

Two sows for breeding.

Poultry.

In this section the 1937-38 balance sheet for the flock of sheep is given and also an estimated balance sheet for the pigs. No poultry figures are available as yet.

There is not very much natural grazing at the Central Experimental Farm and, in consequence, the sheep had to be fed a fair amount of grain.

The figures for feeding pigs were obtained from the Livestock Officer of the Department of Agriculture.

SHEEP.

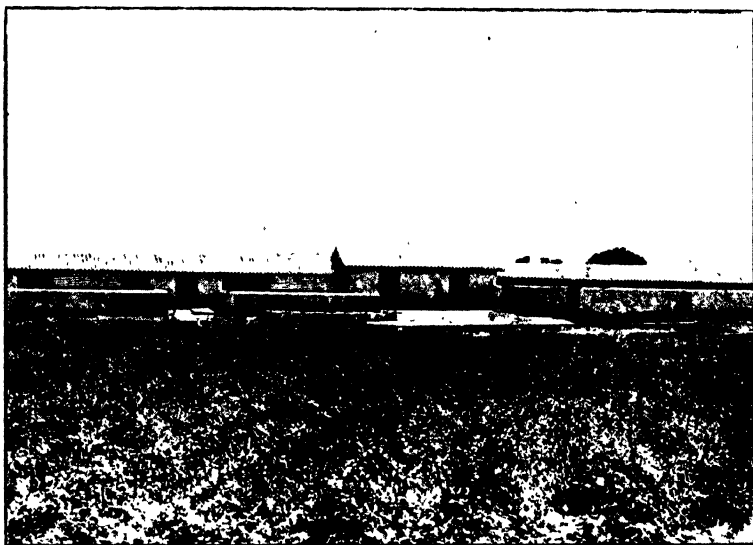
COSTING ACCOUNT OF SHEEP KEPT AT CENTRAL EXPERIMENTAL FARM, MORPHOU, FOR THE PERIOD 1ST OCTOBER, 1937, TO 30TH SEPTEMBER, 1938.

(Cost excludes Natural Grazing).

Dr.	£	s.	p.		Cr.	£	s.	p.
To balance, by valuation of 59 sheep, as on the 1st October, 1937 ..	82	10	0		Sale of 2,807 okes milk	38	19	6
Value of 40 kilés barley (<i>a</i> 2s. 4½ <i>p.</i> per kilé ..	4	10	0		Sale of 36 lambs ..	26	6	5
Value of 40 kilés oats (<i>a</i> 1s. 6 <i>p.</i> per kilé ..	3	6	6		Sale of 8 ewes ..	10	5	8
Value of 12 camel loads straw (<i>a</i> 4s. per load	2	8	0		Sale of 2 rams ..	5	5	0
Value of 24 donums hay consumed green (<i>a</i> 6s. 6 <i>p.</i> per donum (cost of crop only as it failed). ..	8	0	0		Sale of 59 okes wool	3	18	6
Wages of a shepherd for 365 days (<i>a</i> 2s. 2 <i>p.</i> per day	40	11	1		Value of manure, from 59 large animals (<i>a</i> 2s. per head, and from 56 young animals (<i>a</i> 4½ <i>p.</i> per head	7	6	0
Wages of a boy for 180 days (<i>a</i> 1s. per day ..	9	0	0		Valuation of 69 sheep (<i>a</i> 30s. each, as on the 30th September, 1938	103	10	0
4% interest on capital on £254. 15s. 7 <i>p.</i> (including value of <i>mandra</i> , livestock, etc.). ..	10	3	7					
Depreciation on value of <i>mandra</i> . Original cost £110 erected in 1936. 5% on £104. 10s.	5	4	4½					
	166	14	0					
Net profit	28	17	7					
	£195	11	7			£195	11	7
To valuation c/d ..	£103	10	0					
(Average net profit per head 9s. 7 <i>p.</i>)								

ESTIMATED ANNUAL COST FOR MAINTENANCE OF 2 SOWS AND FATTENING OF 20 PIGS.

	<i>Capital.</i>					£
Cost of erection of pig-styes	..	..	..	..	..	77
Purchase of 2 sows 9 months old	..	..	..	..	..	8
Floating capital.	..	..	..	..	..	40
Total	..	..	..	..	..	<u>£125</u>



Pig Styes and Sheep Mandra.

Notes of Method for Maintenance, etc.

(a) 2 sows :—

Feeding :—

Mixture of :—50% barley meal.
50% bran.

Rate :—

1½ okes daily of the mixture each sow for 180 days.

2½ okes daily of the mixture each sow for 65 days.

3¾ okes daily of the mixture each sow for 120 days.

Total feeding stuffs required :—

866 okes barley meal or 54 kilés barley.

866 okes bran.

Annual number of litters per sow, 2.

Average number of piglings per litter, 7.

Total annual number of pigs produced, 28.

Eight piglings, the very bad ones, are to be discarded annually and sold after weaning, thus leaving 20 piglings for fattening every year.

In twelve months, 10 pigs (the first litters) can be fattened for six months after weaning, but the 10 pigs of the second litters will only have been fattened for four months after weaning by the end of the year.

(b) Fattening of 20 pigs.

Feeding :—

Mixture of : 60% barley meal.

30% bran.

10% carob meal.

Rate :—

Prior to weaning $\frac{1}{4}$ to $\frac{1}{2}$ oke per day per head.

1st month after weaning 1 oke per day per head.

2nd month after weaning $1\frac{1}{4}$ to $1\frac{1}{2}$ okes per day per head.

3rd month after weaning 2 okes per day per head.

4th month after weaning $2\frac{1}{2}$ okes per day per head.

5th month after weaning $2\frac{1}{2}$ to 3 okes per day per head.

6th month after weaning 3 okes per day per head.

Total Feeding Stuffs required.

Lot I.	10 pigs	fattened for 6		
months	..	..	..	3,850 okes
Lot II.	10 pigs	fattened for 4		
months	..	..	..	2,150 okes
	Total	..	..	6,000 okes of the mixture, or,
Lot I.				
Barley meal	..	..	..	2,310 okes or 144 kilés
Bran	..	..	..	1,155 okes
Carob meal	..	..	..	385 okes
				3,850 okes
Lot II.				
Barley meal	..	..	..	1,290 okes or 81 kilés
Bran	..	..	..	645 okes
Carob meal	..	..	..	215 okes
				2,150 okes
				6,000 okes
Total:				
				3,600 okes barley meal or 225 kilés.
				1,800 okes bran.
				600 okes carob meal.
				6,000 okes.

BALANCE SHEET.

(a) When Piglings are fattened.

Dr.

(a) Valuation :—

To valuation

(b) Maintenance of 2 sows :—

54 kilés barley @ 2s. per kilé ..

866 okes bran @ 45 paras per oke ..

(c) Fattening of 10 pigs for 6 months after weaning :—

144 kilés barley @ 2s. per kilé ..

1,155 okes bran @ 45 paras per oke ..

385 okes carob meal @ 1½p. ..

(d) Fattening of 10 pigs for 4 months after weaning :—

81 kilés barley @ 2s. per kilé ..

645 okes bran @ 45 paras per oke ..

215 okes carob meal @ 1½p. ..

(e) Miscellaneous :—

Wages of a woman for 365 days (only

½ day's wage charged) 91 days @ 7p. ..

4% interest on capital of £125 ..

5% depreciation on £77 value of

pig-styes ..

15% depreciation on £8, value of 2 sows ..

Profit

To valuation c/d £6. 16s.

£ s. p.
50 0 0
25 0 0
3 4 0
1 0 0
6 16 0

10 pigs fattened for 6 months of 90 okes
L.W. each (70 okes D.W.) @ £5 ..
10 pigs fattened for 4 months of 50 okes L.W.
each (35 okes D.W.) @ 50s. ..
8 piglings 2 months old @ 8s. each ..
Manure (estimated)
Valuation of 2 sows

£ s. p.
8 0 0
5 8 0
5 8 2
10 16 2
24 16 5
13 18 4
13 7 4
70 18 6
15 1 3
£86 0 0

£86 0 0

(b) When Piglings are sold soon after weaning, i.e. at 2 months old.

Dr.				Cr.					
(a) Valuation :—				£	s.	p.	£	s.	p.
To valuation				..	..	..	20	0	0
(b) Maintenance of 2 sows :—				..	..	..	3	4	0
54 kilés barley @ 2s. per kilé ..				5	8	0	..	..	..
866 okes bran @ 45 paras per oke				5	8	2	..	..	..
							6	16	0
(c) Feeding 28 piglings for 1 month prior to weaning :—				10 16 2			..	..	..
10½ kilés barley @ 2s. per kilé ..				1	1	0	20 piglings @ 20s. ..	..	..
84 okes bran @ 45 paras per oke ..				..	10	4	8 piglings @ 8s. ..	..	..
28 okes carob meal @ 1½p. per oke				..	4	6	Manure (estimated) ..	..	..
							Valuation of 2 sows ..	..	..
(d) Miscellaneous :—				1 16 1			..	..	..
Wages of a woman for 365 days (only ½ day's wage charged) 46 days @ 7p. ..				1	15	7			
4% interest on capital of £60 ..				2	8	0			
5% depreciation on £40 value of pig-stye ..				2	0	0			
15% depreciation on £8 value of 2 sows ..				1	4	0			
							7	7	7
Profit				28 0 1					
				2 1 8					
							£30	2	0
				£30 2 0					

16. CONCLUSION.

It is hoped that two items have been sufficiently emphasized in the preceding notes. These items are firstly the value of water used to the full and secondly the value of intelligent rotations. It is beyond the scope of this article to discuss the various ways in which these two items can be utilized to best advantage, but it may be said that it is not always the highest yielding crop that pays best. In Cyprus it is not difficult on a modern farm to grow crops out of season and obtain, by doing so, double the normal price or even more to compensate for lower yields.

WEIGHTS AND MEASURES.

Cyprus Weights and Measures in common use and their equivalents in Imperial Weights and Measures.

<i>Capacity.</i>		<i>Length.</i>	
2 pints	= 1 quart	12 inches	= 1 foot
2 $\frac{4}{5}$ quarts	= 1 Cyprus litro	2 feet	= 1 pic
4 quarts	= 1 gallon	3 feet or	
8 gallons	= 1 kilé = 1 English bushel (very nearly)	$1\frac{1}{2}$ pics	= 1 yard
9 quarts	= 1 kouza | Liquid	33 pics	= 1 chain
16 kouzas	= 1 load | measure.	2,640 pics	= 1 mile.
<i>Weight.</i>		<i>Land Measure.</i>	
400 drams	= 1 oko	1 donum = 60 pics or 40 yds. square =	
1 $\frac{4}{5}$ okes	= 1 Cyprus litro	14,400 square ft. = 40/121 of an acre	
44 okes	= 1 kantar	3,025 donums = 1 acre	
180 okes	= 1 Aleppo kantar	1,936 donums = 1 square mile	
800 okes	= 1 Ton	Farmer's don. (irregular) = about $1\frac{1}{2}$ don.	
100 „ (aprox.)	= 1 Camel load (straw)	<i>Currency.</i>	
50 „ (aprox.)	= 1 Cart load of manure.	40 paras	= 1 piastre
		1 piastre	= $1\frac{1}{2}$ pence (English)
		9 piastres	= 1 shilling
		20 shillings	= 1 pound (based on the £ sterling).

Report by the Chief Grader and Inspector of Produce on the 1938-39 Citrus Export Season.

The outstanding feature of the season was the huge increase in the quantity of citrus shipped as "Early Season Fruit"; by the end of the year practically all the fruit in the Famagusta area had been disposed of.

2. Morphou and Lefka Districts also supplied a certain amount of "Early Season Fruit," but the bulk of the crop was held up for the later markets and better prices; this checked export and towards the end of the season prices fell considerably.

3. The citrus season opened with a consignment of lemons on 8th September, 1938, and finished on 23rd June, 1939. A total of 47,005 cases was exported, as against 30,899 cases in 1937-38, an increase of 16,106 cases. Prices ranged from 8s. to 14s. per case in the United Kingdom.

Purchase prices were from 14s. to 21s. per 1,000 in the gardens.

The increased demand was considered to be due to the small supplies coming forward from Spain.

4. Exports of oranges totalled 309,509 cases, a decrease of 12,706 cases compared with the 1937-38 exports; this drop was due partly to a smaller crop and to some extent to the Lefka-Morphou growers demanding a high price which returns did not justify. A part of the crop was, therefore, not disposed of.

The export of oranges began on the 24th October, 1938, and ended on 17th June, 1939.

Reports stated that the fruit of the early consignments was of poor colour, though good prices were realized.

5. 268,131 cases were exported as "Early Season Fruit" to United Kingdom and Scandinavian ports, the remaining quantity to United Kingdom and other ports, as graded oranges.

6. Many of the fruits were coarse and thick skinned and some buyers expressed dissatisfaction. There were also complaints about the great variation in the sizes of the cases used and the counts of fruit packed.

7. Market prices varied from 6s. 6p. to 15s. per case in the United Kingdom. The "Early Season Fruit" was sold f.o.b. at 7s. to 9s. per case.

Purchase prices in the gardens ranged from 20s. to 32s. for Famagusta oranges and 20s. to 50s. for Lefka and Morphou fruit, per 1,000.

8. Bitter Oranges.—6,425 cases were shipped, a substantial increase over the 2,572 cases of 1937–38. Purchase prices varied from 10s. to 16s. per 1,000.

The fruit would undoubtedly meet with a much better demand if more attention were given to maturity and colour, as both these characters are essential for fruit used for preserves especially in the United Kingdom.

9. Grapefruit.—New plantations are maturing and the crop is rapidly increasing. 10,751 cases were exported compared with 1,770 in the previous season.

Purchase prices were from 35s. to 45s. per 1,000.

It is estimated that these figures will be doubled in the coming season.

10. Mandarins.—The type of mandarin grown is not very suitable for the export trade and previous attempts at marketing have been failures. During the season under review, however, exporters were successful in shipping some 2,034 bundles, which realized good prices, namely 15s. to 17s. per bundle.

These bundles consist of specially designed trays, three of which are packed together with strapping and form a package about the size of an ordinary citrus case.

Purchase prices were 8s. to 9s. per 1,000.

11. Sweet Limes.—16 packages only, for seed purposes, were exported.

12. One case only of citrons was shipped.

GENERAL.—Although the quantity of oranges exported shows a decrease, the total figures for citrus show an increase of 18,267 cases. The totals for the last three seasons are as follows :—

1936–37	..	..	..	..	301,158 packages.
1937–38	..	..	..	..	357,458 "
1938–39	..	..	..	..	375,725 "

Much immature fruit was presented for inspection in the early part of the season, and a number of complaints were received on this matter, especially with regard to poorly coloured consignments.

The following tables show the quantities of exports month by month from all ports and the quantities imported by various countries,

LIST SHOWING EXPORT MONTH BY MONTH FROM ALL PORTS.

1938	Oranges packages	Lemons packages	Grapefruit packages	Bitter Oranges packages	Manda- rins packages	Citron p/ges.	Sweet- limes p/ges.
September ..	—	9,256	—	—	—	—	—
October ..	33,413	12,875	7,915	—	—	—	1
November ..	223,940	3,694	2,371	1,890	295	—	15
December ..	16,860	6,110	465	4,039	1,739	—	—
Total ..	274,213	31,935	10,751	5,929	2,034	—	16
1939.							
January ..	1,224	9,156	—	496	—	1	—
February ..	1,362	3,623	—	—	—	—	—
March ..	3,030	446	—	—	—	—	—
April ..	23,220	605	—	—	—	—	—
May.. ..	6,224	819	—	—	—	—	—
June ..	236	421	—	—	—	—	—
Total ..	35,296	15,070	—	496	—	1	—
Grand Total	309,509	47,005	10,751	6,425	2,034	1	16

DESTINATION AND TOTAL QUANTITIES TAKEN BY EACH COUNTRY
DURING THE SEASON 1938-39.

Country	Oranges p/ges.	Lemons p/ges.	Grapefruit p/ges.	Bitter oranges p/ges.	Manda- rins p/ges.	Citron p/ges.	Sweet limes p/ges.
United King- dom ..	188,463	44,269	10,258	6,369	2,034	1	—
Norway ..	75,659	777	261	56	—	—	—
Sweden ..	24,345	—	—	—	—	—	—
Finland ..	6,650	—	—	—	—	—	—
Denmark ..	3,880	—	—	—	—	—	—
Egypt ..	4,556	1,082	207	—	—	—	16
Yugoslavia ..	2,011	—	—	—	—	—	—
Port-Sudan ..	1,615	—	—	—	—	—	—
Aden ..	768	131	—	—	—	—	—
Malta ..	600	—	25	—	—	—	—
Belgium ..	500	50	—	—	—	—	—
Turkey ..	—	684	—	—	—	—	—
Italy ..	150	—	—	—	—	—	—
Lithouania ..	25	10	—	—	—	—	—
French Somali- land ..	30	2	—	—	—	—	—
Holland ..	18	—	—	—	—	—	—
Singapore ..	239	—	—	—	—	—	—
Total ..	309,509	47,005	10,751	6,425	2,034	1	16

The Colour of Red Wines.

By P. C. ANTONIADES, *Viticulturist and Wine Expert.*

OWING to the restrictions and prohibitions in force in those countries to which Cyprus wines are exported, it is important to obtain wines rich in colour as these wines are always preferred to fetch better prices on the market.

There are several ways of obtaining wines rich in colour and the variety of the grape is of great importance. Varieties capable of producing deep colouration, owing to the richness of the pigment in the skins of the grapes, exist in Cyprus, particularly local variety Maratheftico and the imported varieties Lefkas and Mavrodaphni. Lefkas is the richest in colour, being $3\frac{1}{2}$ times richer in colour than the Maratheftico and 7 times richer in colour than the local variety Mavron. When establishing a vineyard, it is of great importance that one or other of these varieties should be planted in the proportion of 10%–15% so as to improve the colour of the wines. Other varieties introduced from France as seeds, the Hybrides teinturiers Bouschet, have just started producing grapes at Government experimental vineyards, Saittas. These varieties, which will be propagated next year, not only possess rich colour in the skins of the grapes, but also in the juice and flesh, thus producing an even more deeply coloured wine than that produced by Lefkas.

The size of berries also plays its part in the degree of colouration of the wine. Small berries have a larger proportion of skins to pulp than large berries, which is why wines produced from our local variety Mavron are of deeper colouration when the variety has been grown on poor soils, which produce small berries, than when it has been grown on rich soils, which produce large berries.

Ripe grapes give the best coloured wines, while overripe grapes have their colouring matter oxidised and produce wines poor in colour. Similarly the acid content of the grapes helps to give a brighter red colour and to keep the colour in solution in the wine. Cyprus wines, being poor in acidity, are not bright-coloured and the colour is later precipitated unless ingredients to increase the acidity, such as tartaric acid, gypsum or unripe grapes are added during fermentation. After fermentation has started a proper contact between must and skins should be facilitated to help the extraction of colour. The use of sulphur dioxide improves, to a certain extent, the brightness of colour.

If, by pressing the grapes and immediately removing the first juice, a certain quantity of rosy or white wines are made from red grapes, a greater proportion of skins is produced which, when put in fermentation alone or with other crushed grapes, produces a wine richer in colour. When a proportion of crushed grapes is heated with must, the dissolution of colour is assisted and a must very rich in colour is produced; 10% of this must, added to wines in fermentation, will greatly improve colour,

The Semichon method (Superquatre fermentation) of wine-making is also recommended as facilitating the extraction of colour from the skins of the grapes during fermentation. This method is described below :—

Wine, which has just completed its first fermentation is added to a fresh must or crushed grapes with their must, which has not yet started fermentation, in such a proportion as to bring the alcoholic content of the mixture up to 4% by volume. This enables fermentation of the must to start earlier as the young wine which was added is still full of fresh yeast. The 4% alcoholic solution suppresses a large part of the noxious micro-organisms, which are generally developed in a must before fermentation and, owing to the dilution of the must with the young wine, the sugar concentration is also diluted which is beneficial to fermentation by keeping the fermentation temperature lower. Furthermore, the addition of the young wine to the crushed grapes helps the extraction of colouring matter as the latter is better dissolved by an alcoholic solution.

If one or more of the methods mentioned above, or even all of them, are utilized the colour of Cyprus red wines will undoubtedly be greatly improved.

Tree-Planting, 1938-39.

There were 132 tree-planting areas at the end of the 1938-39 season as compared with 125 at the end of the 1937-38 season. New areas were declared at Pharmakas, Kouka, Perivolía, Kiti, Knodhara, Tris Elies and Sophtadhes. The total area now set aside as tree-planting areas is approximately 236,000 donums, equivalent to 122 square miles which is considered very satisfactory.

The total number of trees planted is estimated to be 234,245 in tree-planting areas and 539,238 trees outside tree-planting areas. In addition 856 donums of vines and 159 donums of acacia were planted in tree-planting areas and 3,087 donums of vines and 47 donums of acacia outside tree-planting areas.

The figures compared with those for 1937-38 show a large decrease in the number of forest trees, almonds and vines planted while there is a remarkable increase in all other fruit trees and acacias.

A summary of the trees planted in each district is given in the accompanying table.

The planting season was normal and is expected that few failures will be observed in the trees planted.

TREES PLANTED IN TREE PLANTING AREAS (PLANTING SEASON 1938-39).

District or Beat	Almonds No.	Olives No.	Carobs No.	Citrus No.	Vines don.	Misc. fruit trees No.	Acacias don.	Forest trees No.	Remarks
Nicosia, Lefka and Nisou	40,200	3,100	8,000	10,200	170	2,300	134	3,800	
Kyrenia ..	2,410	590	405	601	140	1,351	—	200	
Larnaca ..	39,970	988	2,720	1,190	126	1,324	6	1,848	Total trees = 234,245
Limassol and Agros	19,150	250	2,200	30	67	420	—	450	Vines (dons.) = 856
Limassola	12,145	548	20	—	32	232	19	1,433	Acacia (dons.) = 159
Paphos and Ay. Amvrosios	33,808	400	150	92	207	1,787	—	—	
Saitta ..	13,945	—	—	150	66	670	—	—	
Trikoukkia ..	6,000	—	—	—	—	3,250	—	—	
Arminou ..	8,844	84	—	163	45	1,885	—	—	
Peristerona ..	3,950	10	—	270	3	352	—	350	
Total ..	180,422	5,970	13,495	12,696	856	13,571	159	8,091	

TREES PLANTED IN NON-TREE PLANTING AREAS (PLANTING SEASON 1938-39).

Nicosia, Lefka and Nisou	63,800	16,600	600	33,500	478	8,890	24	40,500	
Kyrenia ..	16,260	1,887	882	2,811	55	510	—	2,456	
Larnaca ..	25,553	6,726	8,620	9,727	688	4,915	54	6,556	
Limassol and Agros	30,730	3,712	2,275	7,655	584	7,175	—	8,390	
Limassola	8,565	7,312	9,130	33,000	375	5,618	189	30,327	Total trees = 539,238
Paphos and Ay. Amvrosios	60,070	2,810	2,056	4,345	713	3,345	—	—	Vines (dons.) = 3,087
Saitta ..	10,430	110	—	760	97	1,880	—	—	Acacia (dons.) = 267
Trikoukkia ..	8,000	—	—	—	—	16,350	—	—	
Arminou ..	5,627	644	—	447	78	697	—	—	
Peristerona ..	5,640	3,765	—	535	19	105	—	6,940	
Total ..	234,675	43,566	23,563	92,780	3,087	49,485	267	95,169	

EDITORIAL AND ADVERTISEMENT NOTICES

All communications for publication should be addressed to the Editor, *Cyprus Agricultural Journal*, Department of Agriculture Nicosia.

Contributions are invited, written on one side of the paper only. It should be understood that unaccepted manuscripts can not be returned unless postage is prepaid.

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For Wants, Articles for Sale or Exchange, Notices of Meetings Events, etc., for the first 16 words, 2s. Exceeding 16 words but not exceeding 32 words, 4s. For every additional 8 words 6p.

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The "*Cyprus Agricultural Journal*" is published in March, June September and December.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

Meteorological Data, Cyprus.**SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS.
JUNE, 1939.**

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	88.77	63.57	3.21	6	1.90	0.46	—
Athalassa	—	—	2.62	5	0.90	0.37	—
Morphou	84.53	61.46	1.94	3	1.42	0.12	—
Makhaeras	—	—	Nil	Nil	Nil	0.47	—
<i>Famagusta District :</i>							
Famagusta	89.33	64.80	0.32	2	0.21	0.16	—
Akhyritou	86.90	61.40	1.34	4	0.55	0.27	—
Rizokarpaso	—	—	1.78	1	1.78	0.18	—
Lefkoniko	—	—	0.81	3	0.35	0.19	—
<i>Larnaca District :</i>							
Larnaca	86.80	59.99	0.25	2	0.15	0.05	—
Lefkara	—	—	0.72	3	0.55	0.20	—
<i>Limassol District :</i>							
Limassol	85.33	61.47	0.17	2	0.10	0.04	—
Saittas	—	—	2.08	4	1.16	0.83	—
Trikoukkia	73.23	50.50	2.60	4	1.15	0.41	—
Alekhthora	—	—	Nil	Nil	Nil	—	—
<i>Paphos District :</i>							
Paphos	74.17	61.90	0.32	3	0.22	0.03	—
Polis... ..	—	—	0.25	2	0.15	0.03	—
<i>Kyrenia District :</i>							
Kyrenia	83.14	65.22	1.92	2	1.72	0.20	—

JULY, 1939.

<i>Nicosia District :</i>							
Nicosia	97.87	71.74	Nil	Nil	Nil	0.01	—
Athalassa	—	—	"	"	"	—	—
Morphou	94.19	67.22	"	"	"	—	—
Makhaeras	—	—	0.60	1	0.60	0.15	—
<i>Famagusta District :</i>							
Famagusta	98.38	72.48	0.61	1	0.01	0.01	—
Akhyritou	95.06	70.00	Nil	Nil	Nil	—	—
Rizokarpaso	—	—	"	"	"	—	—
Lefkoniko	—	—	"	"	"	0.01	—
<i>Larnaca District :</i>							
Larnaca	94.30	67.40	"	"	"	—	—
Lefkara	—	—	0.14	2	0.07	0.01	—
<i>Limassol District :</i>							
Limassol	93.03	68.26	Nil	Nil	Nil	—	—
Saittas	—	—	"	"	"	0.27	—
Trikoukkia... ..	81.16	58.03	1.05	2	0.75	0.18	—
Alekhthora	—	—	Nil	Nil	Nil	—	—
<i>Paphos District :</i>							
Paphos	83.48	70.13	"	"	"	—	—
Polis... ..	—	—	"	"	"	—	—
<i>Kyrenia District :</i>							
Kyrenia	89.26	75.22	"	"	"	—	—

Note.—Compiled from returns furnished by Public Works Department.

AUGUST, 1939.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	96.58	69.48	—	—	—	0.11	—
Athalassa	—	—	—	—	—	0.17	—
Morphou	92.07	67.52	—	—	—	—	—
Makhæras	—	—	—	—	—	0.26	—
<i>Famagusta District :</i>							
Famagusta	96.06	68.70	0.58	1	0.58	0.06	—
Akhyritou	93.74	68.74	—	—	—	—	—
Rizokarpaso	—	—	0.10	1	0.10	0.01	—
Lefkoniko	—	—	0.15	1	0.15	0.16	—
<i>Larnaca District :</i>							
Larnaca	93.64	68.13	—	—	—	—	—
Lefkara	—	—	2.12	4	1.10	0.22	—
<i>Limassol District :</i>							
Limassol	90.77	67.03	—	—	—	—	—
Saittas	—	—	0.30	2	0.25	0.20	—
Trikoukkia	78.24	55.83	1.37	1	1.37	0.50	—
Alekhthora	—	—	—	—	—	—	—
<i>Paphos District :</i>							
Paphos	80.55	70.84	—	—	—	—	—
Polis... ..	—	—	—	—	—	—	—
<i>Kyrenia District :</i>							
Kyrenia	84.94	71.52	—	—	—	—	—

Note.—Compiled from returns furnished by Public Works Department.

Short List of Government Publications.

(Obtainable, post free, from the Superintendent, Government
Printing Office, Nicosia, Cyprus.)

AGRICULTURE, FORESTS AND MINERALS.	s.	d.
Agriculture—Report for 1932, 1933, 1934, 1935, 1936 & 1937	3	0
Cupriferous Deposits, by Professor C. Cullis & A. Edge—1927	5	0
Forest Administration Report, 1935, 1936 and 1937 .. (each)	1	0
Forest Conservancy, by P. G. Madon—1930	3	0
Forestry, Summary of Report by R. S. Troup—1930 ..	1	0
Fungi of Cyprus, First List of, by R. M. Nattrass—1937 ..	2	0
Geology of Cyprus, by C. Bellamy & A. Jukes-Browne—1905	2	0
Insect Pests & Fungus Diseases, by H. Morris (T. or G.)*—1932	—	6
Inspector of Mines, Annual Report, 1930, 1931, 1932, 1934, 1935 and 1937 (each)	1	0
Irrigation Work in Cyprus, Report on, by Col. Ellis—1922..	10	0
Mineral Substances Utilized in the Arts, by P. Gennadius—1905	1	0
Soil Erosion in Cyprus, by A. Pitcairn—1937	—	6
Water Supply in Cyprus, Progress Report, half-year ended 31.12.38, by Dr. C. Raeburn—1939	—	—

Agricultural Department Publications.

THE following bulletins and leaflets have been published in English, Greek or Turkish as indicated by the letters *E.*, *G.* or *T.* after each title.

BULLETINS.

Industrial Series :

No. 1.—“The Grape and Wine Industry of Cyprus.” By M. T. Dawe, O.B.E., F.L.S. *E.*

No. 2.—“The Tanning Industry.” By M. T. Dawe, O.B.E., F.L.S. *E.*

Horticultural Series :

No. 1.—“Some Observations on the Citrus Industry of Palestine, with reference to Application of Improved Methods to the Citrus Industry of Cyprus.” By B. J. Weston, M.A., M.Sc., F.R.H.S. *E.*

No. 2.—“Picking, Grading and Packing of Citrus Fruits. A Guide for Exporters.” By B. J. Weston, M.A., M.Sc. (Agr.) *E., G. & T.*

The above two series are now combined and the following have been published :—

No. 3.—“Report on Soil Erosion in Cyprus.” By A. Pitcairn. *E., G. & T.*

No. 4.—“Summary of Agricultural Legislation in Cyprus.” *E.*

Entomological Series :

No. 1.—“Investigations into the Locust Plague in Cyprus.” By Ch. G. Pelagias, I.A. (Gx.), F.A.I. (Gx.), (also *Corrigendum*). *E.*

No. 2.—“A Survey of Olive Pests.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.* (*T.* out of print).

No. 3.—“Insect Pests and Fungus Diseases of Cyprus and their Control.” By H. M. Morris, M.Sc., F.E.S. *G. & T.* (*E.* out of print.)

No. 4.—“Injurious Insects of Cyprus.” By H. M. Morris, M.Sc., F.R.E.S. *E.*

Mycological Series :

No. 1.—“The Control of Fungus Diseases.” By R. M. Nattrass, B.Sc., Ph.D., D.I.C. *E., G. & T.*

“A first List of Cyprus Fungi.” By R. M. Nattrass, B. Sc., Ph.D., D.I.C. *E.*

LEAFLETS.

No. 1.—“Petroleum Emulsion.” *G.* (Out of print.)

No. 2.—“Boll Worms of Cotton.” *G.*

No. 3.—“Collection, Sorting and Packing of Oranges.” *G.* (Out of print).

No. 4.—“The Cultivation of the Orange Tree.” *G.*

No. 5.—“*Carpocapsa*” *G.* (Replaced by No. 22.)

- No. 6.—“General Rules for Silkworm Rearing.” *E., G. & T.*
(Reprinted, see also No. 8, Educational Series).
No. 7.—“Cultivation of Almond Trees.” *G.* (Out of print.)
No. 8.—“Soil Manuring.” *G.* (Out of print.)
No. 9.—“Control Measures for Red Scale of Citrus.” *G.* (Out of print).
No. 10.—“Seed Beds.” *G.* (Out of print.)
No. 11.—“The Collection of Sumach.” *G.*
No. 12.—“The Almond Pest (*Eurytoma amygdali*, End.)” *E., G. & T.*
No. 13.—“Outline of the Rat Destruction Campaign for 1930.”
G. & T. (*E.* out of print.)
No. 14.—“Potato Tuber Moth.” *E., G. & T.* (Out of print; replaced
By No. 17).
No. 15.—“Warble Flies.” *E., G. & T.* (*E.* out of print.)
No. 16.—“Downy Mildew of the Vine (*Plasmopara viticola*).” *G. & T.*
(*E.* out of print.)
No. 17.—“Potato Tuber Moth.” *E., G. & T.* (Replaces No. 14.)
No. 18.—“The White Rot of Onions in Cyprus.” *E., G. & T.*
No. 19.—“The Production of Silage.” *E., G. & T.* (Out of print;
see No. 7 Educational Series.)
No. 20.—“Importation of Plants, Fruit, etc., into Cyprus.” *E.*
(Reprinted and brought up to date.)
No. 21.—“*Ceratitis capitata*, Wied. Mediterranean Fruit Fly.”
E., G. & T.
No. 22.—“Pests of the Apple Tree.” *E., G. & T.* (Replaces No. 5.)
No. 23.—“Citrus Wastage.” *E., G. & T.*
No. 24.—“Pests of Citrus Trees and Fruit.” *E., G. & T.*
No. 25.—“The Ox-Warble Fly.” *E., G. & T.*

Educational Series :

- No. 1.—“Agricultural Resources of Cyprus.” *E., G. & T.*
No. 2.—“Breeding, Feeding & Management of Cattle.” *E., G. & T.*
No. 3.—“Agricultural Calendar.” *E., G. & T.*
No. 4.—“Linseed (*Linum usitatissimum*).” *E., G. & T.*
No. 5.—“Sesame (*Sesamum indicum*).” *E., G. & T.*
No. 6.—“Production of Olives and Olive Oil.” *E., G. & T.*
No. 7.—“Production of Silage.” *E., G. & T.*
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No. 18.—“Diseases of Cattle with Special Reference to Cyprus.”
E., G. & T.

The Horse Breeding Law, 1930.

LIST OF STALLIONS LICENSED FOR 1939.

NICOSIA DISTRICT.			
<i>Village</i>		<i>Owner's name</i>	<i>Reg. No.</i>
Akaki ..	..	Michael Th. Rafti ..	29
do. ..	..	Moisis Michael Tchingi ..	203
do. ..	..	Marikkou Yorgi ..	240
Argaki ..	..	Polyvios Theophani ..	153
Astromeritis ..	..	Christoforos Evangeli ..	26
Kalokhorio ..	..	Yioryis Papaconstantinou ..	262
Lefka ..	..	Ahmet Dopran Salih ..	255
Lymbia ..	..	Andronikos Petri ..	32
do. ..	..	Heraclis Lambi ..	66
Mammari ..	..	Nicolas Haji Haralambous ..	45
Morphou ..	..	Vasilis T. Spanos ..	18
do. ..	..	Andreas Ahapittas ..	249
Nicosia ..	..	Mehmed Kioutchouk ..	304
Pera ..	..	Yiannis G. Magou ..	194
Pera Khorio ..	..	Tofis Michael ..	294
Yeri ..	..	Yeoryos Petri ..	16
Yerolakkos ..	..	Haji Michael Haji Loi ..	35
do. ..	..	Toglis Charalambi ..	22
LARNACA DISTRICT.			
Alaminos ..	..	Rifat Jumaa ..	260
do. ..	..	Salih Jumaa ..	64
Aradhippou ..	..	Costis Kyriakou ..	15
do. ..	..	Lefteris Towli ..	225
Athienou ..	..	Costas N. Haji Vrashimi ..	96
do. ..	..	Vasilis M. Phiakou ..	169
do. ..	..	Nicolas Vassili Phiakou ..	276
Larnaca ..	..	Ipermachos Kyriakou Petroladhas ..	288
Voroklini ..	..	Panayis Theodosi ..	106
FAMAGUSTA DISTRICT.			
Akanthou ..	..	Yiannis Hambi ..	270
Asha ..	..	Antonis Michael ..	92
do. ..	..	Christos Haji Lavithi ..	234
do. ..	..	Kyriakos Antoni ..	239
do. ..	..	Apostolou Hj. Zannetou ..	274
do. ..	..	Eleni Demetri Kounalli ..	208
Ayios Andronikos ..	..	Spyros Yeoryi ..	65
Ayios Elias ..	..	Constantis Stylli ..	246
do. ..	..	Yeorgios Christodoulou ..	265
Ayios Seryios ..	..	Nicolas Yeoryi ..	219
Chatos ..	..	Ahmet Koja Ibrahim ..	285
Ephtakomi ..	..	Kyriakos G. Xydonta ..	298
do. ..	..	Antonis Andrea ..	299
Galatia ..	..	Akil Mustafa Gonie ..	54
Kalopsidha ..	..	Yeoryios Antoniou ..	267
Komi Kebir ..	..	Kyriakos Constanti ..	68
Kondea ..	..	Christos Hanni ..	259

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Lefkoniko	..	Mehmed Salih	..	38
do.	..	Christos Haji Symeon	..	241
Lysi	..	Minas Lysandrou	..	80
do.	..	Demetris Topha	..	227
do.	..	Yangos M. Katsouris	..	301
Melanagra	..	Kallis Kyriakou	..	60
Milea	..	Sotira Panayi	..	284
do.	..	Panayis Loizi Haji Rousou	..	296
Ovgoros	..	Djafer Emin A. M. Mustafa	..	213
Paralimni	..	Andreas K. Xiouri	..	72
do.	..	Evangelis Haji Vraha	..	172
do.	..	Nicolas G. Tsiakouras	..	210
do.	..	Avraamis Anastasi	..	258
Peristeronopiyi	..	Theoklis Towli	..	305
do.	..	Const. K. Haji Yeoryi	..	73
Phrenaros	..	Kyriakos Theori	..	71
Rizokarpaso	..	Nicolas Chr. Barbotta	..	171
do.	..	Pandelis N. Haji Hari	..	281
do.	..	Anna Pavlou Matheou	..	300
Sotira	..	Vasilis Demetri	..	252
Stylos	..	Annczou Nikou	..	269
Trikomo	..	Marikou Kyriakou	..	224
do.	..	Kyprianos Stylli Haili	..	268
do.	..	Patroelos Kyriakou	..	297
Vatili	..	Andreas C. Iona	..	86
do.	..	Vasiliki Haji Christodoulou	..	89
Yenagra	..	Kyriacos Christofi	..	206
Yialousa	..	Christofis Panayi Pitchi	..	280
LIMASSOL DISTRICT.				
Anoyira	..	Thoukis Solomi	..	143
Asgata	..	Demosth. Evangeli	..	295
Ay. Phyla	..	Costis P. Silikiotis	..	118
Evdhimou	..	Ahmed H. Shukri	..	303
Pakhna	..	Theodoros Evgeniou	..	121
do.	..	Haralambos M. Kais	..	283
Phasoula	..	Nicolas Evangelis	..	272
Phasouri	..	Cyprus-Palestine Plantations, Co.	..	302
PAPHOS DISTRICT.				
Dhrousa	..	Yiannis Sava	..	139
Khoulou	..	Ahmet Kiazim	..	289
Kissonerga	..	Evangelis Haji Nicola	..	126
do.	..	Haji Towlis Haralambou	..	129
Kouklia	..	Mehmed Hassan Kokkinos	..	215
Ktima	..	Veli Tselebis	..	127
do.	..	Ali Arif Kallikas	..	290
Kelokedhara	..	G. Christodoulou Sirimis	..	275
Lapithiou	..	Mehmed Mulla Osman	..	263
Lasa	..	Yeoryios Ch. Ellinas	..	130
Pano Arodhes	..	Harilaos Nicolaou	..	136
do.	..	Chrysost. Panayiotou	..	214

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Peristerona	..	Solomon Haralambou	..	230
Prodromi	..	Avraamis Sava	..	248
Stroumbi	..	Sofoklis Constanti	..	178
Tala	..	Costis Papa Daniel	..	286
KYRENIA DISTRICT.				
Agridhaki	..	Haralambos Yianni	..	147
Asomatos	..	Christallou Michaeli	..	146
do.	..	Antonis Haji I. Hanni	..	150
Ayios Amvrosios	..	Nicolas Haji Dimitri	..	256
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Ayios Yeoryios	..	Costis Nicola Spanou	..	157
Bellapais	..	Savas K. Demetriades	..	236
Dhiorios	..	Gregoris Haji Michael	..	148
Dhikomo, Kato	..	Loukas G. Loukaides	..	273
Kyrenia	..	Shakir Hussein	..	158
Lapithos	..	Polyk. Panayioti	..	99
Larnaka tis Lapithou	..	Miltiades Constanti	..	152
do.	..	Kleanthis Stylianou	..	287
Myrtou	..	Cleov. Stylianou	..	149
do.	..	Neophytos Christofi	..	293
Sisklipos	..	Lavithis Demetriou	..	232

ANTONIS PETRIS,

8th September, 1939.

Acting Chief Veterinary Officer,
Inspector of Horse Breeding.

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Livestock Officer, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis,

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Superintendent of Agriculture, Morphou.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, and Officers are stationed at Kythrea, Dheftera, Nisou, Morphou, Lefka, Pyrgos and the Nursery Garden, Nicosia.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove and Lysi Nursery Garden. Officers are stationed at Yialousa, Lysi, Lefkoniko and Trikomo and Tobacco Instructor at Yialousa.

LARNACA DISTRICT.

Agricultural Assistant, Mr. C. Miltiades, is in charge including Larnaca Nursery Garden. An Officer is stationed at Skarinou.

LIMASSOL DISTRICT.

Agricultural Assistant, Mr. Kyprianides is in charge and an Officer is stationed at Agros.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Alonaris, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klokkaris, is in charge. Paphos District includes Paphos, Polis and Kelokedhara Nursery Gardens and Officers are stationed at Polis, Stroumbi, Kelokedhara and Ayios Amvrosios (Limassol District).

TROODOS AREA.

Trikoukkia Nursery Garden and Troödos area is in charge of Mr. K. Hamboullas, Agricultural Assistant.

Distribution of Pedigree Stud Animals on 1.9.1939.

<i>Thoroughbred Stallions:</i>	<i>Date of Birth</i>	
Marcher Lord	(1926) ..	at Athalassa.
Life Line	(1922) ..	at Ayios Theodoros.
Pitohford	(1925) ..	at Akhna (on loan).
Friars Flutter	(1927) ..	at Larnaca.
Waterkoscie	(1923) ..	at Lefkoniko.
Moleskin	(1920) ..	at Vatili.
<i>Irish Draught Stallion:</i> Bright Boy	(1936) ..	at Athalassa.
<i>Dales Pony:</i> Sonny Boy ..	(1930) ..	at Ktima.
<i>Welsh Cob:</i> Llwynog's Model..	(1925) ..	at Polis.
<i>Dairy Shorthorn bulls:</i>		
No. 480 Ambassador ..	(1934) ..	at Limassol (on loan).
No. 487 Minstrel ..	(1935) ..	at Nicosia.
No. 488 Conqueror ..	(1936) ..	at Kyrenia (on loan).
No. 491 Prince ..	(1937) ..	at Athalassa.
No. 494 Archer ..	(1937) ..	at Larnaca.
No. 495 Aviator ..	(1937) ..	at Phlasou (on loan).
<i>Kerry Bulls:</i>		
No. 464 Carmoney Monarch	(1935) ..	at Athalassa.
No. 454 Daffy's Evidence	(1932) ..	at Ktima.

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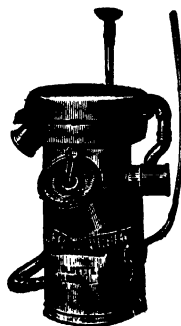
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CORRIGENDA TO BULLETIN No. 5, PAGE 15, DIAGRAM II.

The description of Diagram II should read as follows:—

Rainfall in inches shown as:— —————

Approximate percentage of land without vegetative cover of total area
of annual crops cultivated in 1938 shown as:— — — — —

Estimated percentage of land without vegetative cover of total area of
annual crops cultivated in 1938 if marginal lands were retired and
allowing a 20% increase in legumes and 10% increase in irrigated
crops shown as:— —————

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Panayia Soil Erosion Demonstration Area, Paphos District.

The Cyprus Agricultural Journal

A QUARTERLY REVIEW
OF THE
AGRICULTURE OF CYPRUS

Vol. XXXIV, Part 4. DECEMBER, 1939. Price 3p.

EDITORIAL NOTES.

THE main activities of the Department of Agriculture during the last three months have been concentrated on the stimulation of agricultural effort to ensure that the Colony shall be as nearly as possible self-supporting as far as essential foodstuffs are concerned. Every branch of the Department has been actively engaged in this work and the present issue reflects to some extent the measures taken.

Efforts have been largely directed towards cereal and potato growing, fertilizer, manure and seed supplies, animal husbandry and publicity.

Throughout all this work, which has been supported with enthusiasm by all sections of the agricultural community, the necessity for maintenance of the fertility of the land by the employment of crop rotations, non-utilization of marginal lands and prevention of soil erosion, have been constantly kept in view.

* * * * *

ISSUES OF SEED WHEAT.

With the object of ensuring that land suitable for the production of wheat crops is as fully utilized as possible and that the area under wheat is increased, His Excellency the Governor, with the approval of the Secretary of State for the Colonies, has authorized a scheme for the distribution of seed wheat to agriculturists whose circumstances are such as to justify this assistance. The seed wheat will be issued through Co-operative Societies to approved applicants who are members of such Societies and by Commissioners to approved applicants who do not belong to Co-operative Societies. The wheat will be repayable in kind without interest.

* * * * *

PRICES FOR WHEAT AND BARLEY IN 1940.

A recent announcement communicated for general information by the Public Information Office, stated that it is the intention of the Government to take the necessary measures by Orders made under the Defence Regulations, or otherwise, to fix prices for wheat and barley harvested in 1940 at levels not below those ruling at present.

* * * * *

SEED POTATOES.

Arrangements have been made by Government to ensure that the normal supply of Irish seed potatoes are imported for planting the 1940 summer crop.

In order to increase the area under potatoes, the Government has purchased a certain quantity of locally-grown potatoes which have been inspected in the field and found suitable for seed, being reasonably free

from symptoms of degeneration. These potatoes are offered for sale at 65 *paras* per oke, for payment in cash on delivery ex-store or to certain approved applicants on deferred payment.

As a further safeguard to provide an adequate supply of home-grown seed for all possible requirements, the export of potatoes of a size less than 1½" is controlled.

* * * * *

FLAX.

Arrangements have been made by Government to lease the Zodia Flax Scutching Mill for a period of two years. This mill has been closed for four years but in view of the renewed interest in flax fibre for export this assistance by Government in reopening the Zodia Factory, which was the first scutching factory established in Cyprus, may help to revive interest in the production of flax for fibre.

* * * * *

CONSERVATION OF ANIMAL MANURE AND COMPOST-MAKING.

In view of the high cost and difficulty in getting supplies of artificial fertilizers efforts are being made to stimulate greater interest in compost-making and the better conservation of animal manure.

Demonstrations in compost-making have been arranged at a number of village centres and a standard type manure pit of the design shown on p. 147 is being constructed at a number of selected centres in co-operation with farmers who are prepared to demonstrate the better conservation of animal manure.

* * * * *

UTILIZATION OF GOVERNMENT STATIONS.

At the Central Experimental Farm, Morphou, most of the land will be used for the increased production of seed wheat and seed of winter and summer legumes. The conversion of this station into a commercial seed farm has necessitated the temporary suspension of much of the experimental work on annual crops.

At the Government Stock Farm, Athalassa, efforts are being made to increase the output of breeding stock, especially poultry.

* * * * *

ARTICLES OF AGRICULTURAL INTEREST FOR THE PRESS.

In order to stimulate public interest in agriculture, especially in the production of food crops, increased production of animals and animal products, maintenance of the fertility of the land and increased production of farmyard manure, a number of articles have recently been prepared by Officers of the Department of Agriculture for issue to the press through the Public Information Office. These articles were well received and appreciated by the public and the present issue of this *Journal* consists of a selection from them.

* * * * *

DEPARTMENTAL PUBLICATIONS.

Bulletin No. 5 "Soil and Water Conservation in Cyprus" was issued for circulation this month.

* * * * *

LYSI AGRICULTURAL SHOW.

The 1939 Lysi Agricultural Show, which was held on the 8th September, 1939, was one of the most successful Village Agricultural Shows recently held in Cyprus.

The Show was organized by the Department of Agriculture in co-operation with the Lysi Village Authorities. The Agricultural, Medical and Forest Departments' demonstrational exhibits, which were shown in a row of eight specially constructed exhibition shelters, were a striking success. Over £50 in prize money was offered for 55 classes of agricultural produce and livestock.

His Excellency the Governor, Mr. W. D. Battershill, C.M.G., visited the show and inspected the Government and private exhibits. There was a parade of prize-winning animals in the show-ring before His Excellency.

Two photographs give a general view of the showground and a section of the Government Exhibits.



Lysi Agricultural Show.

OTHER SHOWS.

The Paphos District Show was held at Yeroskipos on the 30th September and a Potato Show was organized by the Avlona Rural Club on the 29th October. A number of shows were abandoned owing to the outbreak of war.

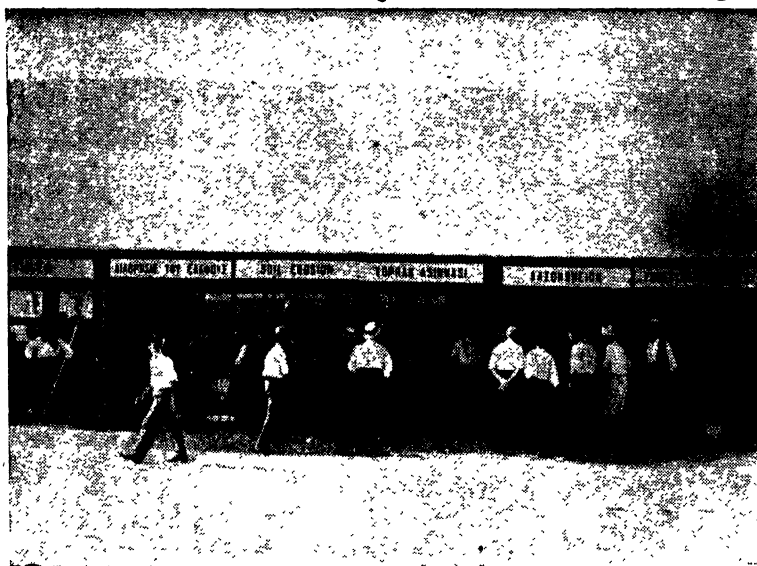
The portable showyard equipment, which consists of the exhibition shelter, show-ring posts and rope, and hurdles for small animals was lent to the organizers of the Yeroskipos Agricultural Show. This equipment will be available for use at selected village shows in future years.

CYPRUS HORTICULTURAL SOCIETY.

The inaugural flower show of the recently formed Cyprus Horticultural Society was held at Nicosia on Saturday, 11th November, 1939

There were 15 classes which included those for chrysanthemums, dhalias, zinnias, carnations and roses.

The show was opened by His Excellency the Governor, Mr. W. D. Battershill, C.M.G.



Section of Government Exhibits, Lysi Agricultural Show.

* * * * *

GATHERING OF OLIVES.

Greater care and attention is necessary at the time of gathering the olive crop.

The treatment the olives receive at the time of harvesting, has a considerable effect on the ultimate product, therefore, whether the olive crop is destined either for pickling or for making olive-oil, the utmost care must be taken by olive-growers to ensure that picking is properly done.

The following important points should be observed and a stop put to harmful practices which only result in waste and the production of considerable quantities of low quality olive-oil :—

(1) Do not pull handfuls of olives from the lower fruit bearing branches or knock or rake off the olives from the higher branches with a stick or pole. These methods damage young fruit bearing branches which result in a heavy loss in production during the following years, they create conditions for harbouring insects, the spreading of plant diseases, and bruised olives easily ferment.

(2) All olives should be picked by hand and olive growers should provide olive pickers with suitable ladders and steps.

(3) Do not drop the olives on to the ground. Olive pickers should be provided with bags and the crop collected in the field in boxes or lined baskets.

(4) Do not mix over-ripe and damaged or diseased olives with good sound olives.

(5) Deliver immediately to the stores of the olive-oil factory all olives destined for the expression of olive-oil,

SERICULTURAL NOTES.

Demonstrational Silkworm Rearings in Girls' Schools during the Year 1939.

Demonstrational silkworm rearings were carried out during the sericultural year 1938-1939 in 118 girls' schools (109 Orthodox-Christian and 9 Moslem) of which 17 were not considered satisfactory for different reasons. Approximately 2,380 school girls and boys attended the demonstrations and were taught the improved methods of hatching the eggs and rearing the silkworms.

The maximum production of cocoons was at the rate of 68 okes per ounce of eggs and the average for the 101 successful rearings was at the rate of 40 okes per ounce of eggs compared with 84 okes and 57 okes respectively last year.

The Agricultural College Old Students' Club Cup for the best demonstration in a girls' school has been awarded for the year 1939 to the Girls' School of Perivolia (Larnaca District), who obtained the highest production of cocoons (68 okes of cocoons per ounce of eggs).

Hibernation of Silkworm Eggs.

Accommodation at Pedhoulas, in the same house as last year, has been rented by the Agricultural Department for the natural hibernation of all locally-produced and imported silkworm eggs. All silkworm eggs are required to remain at the hibernation station from 5th January to 20th February.

Sericultural Station, Kalopanayiotis.

A total of 370 drams of silkworm eggs of different races and crossings was produced in the Sericultural Station, Kalopanayiotis, this year and will be available for sale next sericultural season primarily to silkworm egg-producers for reproduction and for the improvement of their own races.

A quantity of these silkworm eggs will be issued to Girls' Schools free of charge for demonstrational silkworm rearings.

Free Issue of Mulberry Plants.

The Agricultural Department has arranged again this season that mulberry plants from Nursery and School Gardens may be issued free of charge to interested farmers.

Farmers wishing to take advantage of this offer should apply to the nearest Agricultural Station.

A total of 7,507 young mulberry trees was issued last season free of charge from Nursery and School Gardens.

* * * * *

LIVESTOCK NOTES.

Trap-nesting of the poultry on the Government Stock Farm has now been continued for 3 years and the 3rd year's results as are follows:—

86 R.I.R. hens pullets average 140 eggs per annum.

7 Light Sussex pullets average 140 eggs per annum.

22 Native hens average 140 eggs per annum.

The figures for the Rhodo Island Reds are slightly lower than the previous year but good constitution and resistance to disease is considered to be no less important than high egg-production and the present aim is to create a hardy strain of R.I. Reds able to compete with local conditions.

A third Irish Draught Stallion has been obtained from Ireland to replace "Kildare Guard" which was the first of this breed to be imported and which died last year.

The new Stallion "Red Light" is 5 years old and is heavier than "Bright Boy" and has already been used for breeding in Ireland before he was sold. He arrived in November after a voyage of 5 weeks.

A successful auction sale was held at the Government Stock Farm on 17th November when 55 head of stock were sold realizing £167. 2s. 4p. as follows :—

No. of Animals		Average Price		Auction Selling Price.	
—		—		—	
		£	s. p.	£	s. p.
1 crossbred cow fetched ..	..	46	15 0	..	46 15 0
11 ewes averaged ..	..	1	7 2	..	14 19 4½
2 rams averaged ..	..	1	9 2	..	2 18 4½
5 she-goats averaged ..	..	1	2 5	..	5 13 0
7 bull-calves averaged ..	..	3	8 7½	..	24 2 0
2 heifers averaged ..	..	12	8 4½	..	24 17 0
2 sows averaged ..	..	7	15 0	..	15 10 0
10 young sows averaged ..	..	1	4 0	..	12 1 0
15 young boars averaged ..	..	1	7 0	..	20 6 4½
Total	..	..	..	..	£167 2 4
* * * * *		* * * * *		* * * * *	

THE OX WARBLE-FLY CAMPAIGN.

On the 1st December the Veterinary Service resumed its work on the three years campaign against the ox warble-flies, *Hypoderma bovis* and *Hypoderma lineatum*. This campaign, now commencing its second year, aims at the destruction of all warble larvae which are present under the skin of the back, loins, etc., of cattle from December to April.

Last season's work has already made all farmers aware of the manner in which the larvae are destroyed effectively by the application of a *derris* preparation which has no harmful effects on the cattle, and during the summer months it was apparent that working cattle were attacked by the flies only on rare occasions. These satisfactory results are likely to be followed by a considerable reduction in the number of warbles on the cattle during the next four months and it is hoped that with the continued co-operation of village authorities and of the farmers themselves the dressings will be continued this season with the utmost economy of time and labour.

As in the previous season an Order has been issued requiring all owners of cattle to produce their animals at centres and dates which are duly notified in each village. Village Authorities and Rural Constables will assist in ensuring that every animal is produced for inspection by the dressers. The work is being carried out free of cost to the owners of the cattle.

* * * * *

RETIREMENT OF MR. E. PAPADOPOULOS.

Mr. Evriviades Papadopoulos, who retired from the public service with effect from the 18th October, 1939, on reaching the age limit, was an Agricultural Assistant at the Nursery Garden, Nicosia. Mr. Papadopoulos was appointed to his present post on the 1st January, 1929, prior to that he was on the unestablished staff of the Agricultural Department since 1922 and has had temporary employment in the Agricultural and Forestry Departments from 1913 to 1921.

Wheat Growing.

INTRODUCTION.

It is of great importance for Cyprus to produce as much wheat as possible during the present emergency. The production of wheat can be increased in two ways :—

- (a) By increasing the area put down to wheat.
- (b) By increasing the yield of wheat per donum.

Dealing first of all with the area put down to wheat, the question arises as to how far this area can be profitably increased. Since 1918, statistics show that the annual area under wheat has fluctuated between a minimum of 440,000 donums and a maximum of 590,000 donums. Apart from large annual fluctuations, the average area under wheat has remained very much the same for the past 40 years and the variability has been due to such transient factors as rainfall and prices. In the present sowing season it may be possible to put a record area under wheat and it is hoped that the figure of 600,000 donums will be reached. However, it is necessary here to sound a note of caution and the following recommendations are made :—

- (a) The extra wheat area should not be sown at the expense of other food crops, such as barley, on land which is more suitable for those crops.
- (b) Land put down to wheat must be in good condition ; for example, fallow fields should not normally be sown before their usual time.
- (c) Wheat should not be sown on land that cannot reasonably be expected to give a good return.

Increasing the average yield of wheat per donum is a problem of wide application. It may be said here that the average yields obtained in Cyprus compare reasonably well with those of other countries with similar conditions. It is possible profitably to increase the average yield by better methods of crop husbandry, but fantastic statements that are made periodically by ill-informed persons to the effect that the average yield can be increased to double or triple what it is at present may be discounted. Climatic conditions will always exercise the greatest effect on wheat yields although ill-effects from low rainfall can be somewhat alleviated by post-sowing cultivations and raising the humus content of the soil by green manuring or by systematic additions of organic manures. During the drought in the harvest of 1932 the average yield per donum was 2.2 kilés, while in 1918 the average was 5.8 kilés per donum ; these figures show the difference in yields that can be brought about by climatic conditions.

The following notes may be of assistance in pointing the way towards higher yields of wheat.

PRELIMINARY CULTIVATION.

Wheat will grow well on a large variety of soils and it is not possible in this note to describe the characteristics of each beyond the general statement that deep, easily-worked soils will give the best results. If a soil is not fertile or in good condition it is better to sow barley in preference to wheat.

The yield of wheat will be affected by the preceding crop. It should not be grown directly after another cereal, but it can follow a large variety of crops if suitably manured. The best yields are usually obtained when wheat follows a fallow period, but this involves the wasteful procedure of growing only one crop in a period of two years. Fair yields are obtained after winter and summer legumes and also after potatoes and other summer crops, provided that they have been well fertilized and cultivated.

Preliminary cultivation will depend on the nature of the preceding crop. The final ploughing should always be shallow and a further harrowing will usually bring the soil into good condition for sowing. If a period of more than two months has elapsed between the harvest of the preceding crop and the sowing of wheat, one or more ploughings will be necessary before the final ploughing in order to keep the soil in good condition and control weeds. These ploughings should usually be fairly deep and the wooden plough is unsuitable for the purpose.

SOWING.

In general, wheat is sown after the winter rains, but if these are late, the crop can be sown successfully on dry soil, provided that the seed is well covered.

Sowing can be carried out in drills, by hand or by machine, or by broadcasting. Both methods have much to recommend them, broadcasting being quick and cheap while drill sowing ensures a more even distribution and saves a large amount of seed. A seed rate of 12-14 okes per donum is necessary when the seed is broadcast, but half these quantities are sufficient when the crop is drilled.

Part of the fertilizer requirements of the crop should be applied at sowing time. Except where wheat follows a heavily-fertilized summer crop, a dressing of about 40 okes of superphosphate per donum will usually be more than repaid in increased yields. A small dressing of a slow acting nitrogenous manure (*e.g.* 12 okes per donum of sulphate of ammonia) may also be applied with benefit at sowing time, but, in general, nitrogen is most economically utilized if applied partly or wholly as a top-dressing after the shoots have appeared above ground.

After sowing and applying the fertilizer, the seed should be adequately covered by a very shallow ploughing or harrowing. The seed should be perhaps 2" below the surface to enjoy the best conditions for speedy germination. Young shoots will appear within 10 days if weather conditions are favourable, but germination is often greatly delayed by lack of moisture after sowing.

Care must be taken in selecting the variety of wheat to be sown and in choosing a good sample of the correct variety. The three best Cyprus varieties are Kyperounda, Psathas and Tripolitiko, but each of these varieties has a multitude of synonyms and innumerable strains. Kyperounda will give the highest yields when soil and climatic conditions are favourable. Psathas is early maturing and drought resisting and is the heaviest yielder where rainfall is low. Tripolitiko takes a mean position between these two varieties as regards requirements and yield. In the hills, other varieties such as Vroullos and Asprositario are usually preferred, but their cultivation is limited. There are also several varieties, introduced from abroad, that give excellent yields, but the local varieties are usually preferred owing to their many years of adaptation to local conditions. The district staff of the Agricultural Department is in a

position to assist farmers in obtaining pure samples of seed-wheat of the varieties mentioned above and it is no exaggeration to say that in many Cyprus villages the yields of wheat would be increased by 10%, or even more by sowing pure seed of the correct variety instead of the usual poor-yielding mixture.

ATTENTION AFTER SOWING.

When the shoots are a few inches high, a dressing of 10–15 okes per donum of nitrate of soda or other quick acting nitrogenous fertilizer should be given, if possible fairly soon before a shower of rain. This dressing will assist growth and increase the yield, but it may be borne in mind that too much nitrogen can have a deleterious effect by over-encouraging vegetative growth at the expense of grain production.

If river flood-water is available, one or two irrigations will be beneficial except in certain areas during years of exceptionally high rainfall, when water-logging may result. Unfortunately, it appears to be a very widespread belief that the crop will benefit in direct proportion to the amount of water applied at each irrigation. This is emphatically not the case and harm can be done, not only to the crop but to the land itself, if the water is allowed to flood the field for too long a time.

Weeding should not be a serious problem if the system of cropping and cultivation is sound. It will not pay a farmer to weed a wheat crop more than once at the outside and in cases where the land has got very foul, the reason must be sought in the preliminary cultivation and the rotation.

HARVESTING AND THRESHING.

Most farmers know by experience when a crop should be harvested. A rough test of maturity is to test a grain with the thumb nail. If a milky liquid oozes out, the grain is under-ripe, but when it cannot be cut by the nail it is over-ripe. The correct stage is when the grain is still fairly soft but contains no liquid. It is best to harvest as early as possible and leave the sheaves to dry in the field after first forming them into compact groups of 6–10 sheaves with the ears facing upwards, so that the effects of any late rains may be minimized by rapid drying out of the grain.

Most of the Cyprus crop is harvested and tied into sheaves by hand. The sooner mechanical reapers and binders become universal the better. Similarly, the local method of threshing must go sooner or later, but in present circumstances there is no means of adequately improving matters and the best must be made of things as they are. There are three threshing machines operated annually by the Agricultural Department and also several privately-owned combine-harvester-threshers and threshing machines, but these cannot deal with more than a fraction of the crop. The main disadvantage of the local methods of harvesting and threshing lies in the length of time that these operations take. More often than not, late summer rains cause rotting of the grain while the sheaves still stand on the threshing-floor, but here again the ill-effects can be greatly reduced if the stacks are taken to pieces after rain and thoroughly re-dried.

In conclusion, mention must be made of a method of growing wheat that has been tried with success in small areas in Famagusta District and has also been proved statistically to give higher yields at the Central Experimental Farm, Morphou. This method is briefly as follows: The soil is well prepared in the usual manner and sowing is carried out in

drills about 1 foot apart. It is essential that the rows should be fairly straight and evenly sown with a fairly low seed-rate. After the young shoots have come up, the crop is top-dressed with a nitrogenous fertilizer and lightly hoed. Further hoeings and, if necessary, top-dressings are given at suitable intervals. This treatment of the wheat crop has been found to give higher yields when rainfall is low and to enable irrigation to be carried out more easily. In most cases the higher yields obtained have more than compensated for the extra labour involved in hoeing. Farmers growing small areas of wheat are recommended to give this method a trial and detailed advice will be given on application to the Agricultural Department.

Potato Growing.

CONSIDERABLE interest is taken in potato growing, owing to the importance of this crop for export and local food supplies. The planting of a larger area is expected.

SOIL.

The best soils for potatoes are the light red clays that are typical of the villages of Akhna and Avgorou in Famagusta District and Peristerona and Astromeritis in Nicosia District. Light sandy soils also give good results if well manured. Potatoes will, moreover, thrive on most soils in Cyprus and, owing to the large amount of food they produce per unit of area, are eminently suitable for growing in back gardens and anywhere where irrigation water is available.

MANURIAL REQUIREMENTS.

Best results are obtained from combination of organic and artificial manures. Organic manures should be applied at least once every four years to land where potatoes form the main crop of the rotation. An average dressing of animal manure is three tons per donum, but larger quantities may be applied with good results. The most popular artificial fertilizer used for potatoes is the combined fertilizer 6 : 8 : 8 ($N:P_2O_5:K_2O$) and good results are obtained with one or two bags of this fertilizer per donum. Usually half the fertilizer is applied at sowing time and half at the first earthing-up of the crop. If fertilizer should be difficult to obtain, more organic manures must be utilized. The crop should follow leguminous crops in the rotation and "green manuring" should be resorted to.

CROPS.

Two main potato crops are grown each year: One is planted between the middle of January and the end of February and harvested in May-June. This crop is known as the "Summer Crop". The second crop is planted between the end of July and the middle of August and harvested in October and November. This crop is the "Winter Crop". The February planting is usually somewhat the larger of the two crops as more irrigation water is available and, on the whole, larger yields are obtained. In some localities, however, the reverse is true. In the hills and in vegetable gardens there are other plantings of potatoes, but these are of minor importance. Lower yields are obtained if planting is undertaken on dates other than those given above in the main potato-growing localities.

YIELDS.

Two tons per donum is considered a good average yield in the best potato-growing areas. Climatic conditions, while not exercising such a great effect as over the cereal crops, affect the yields considerably.

IRRIGATION REQUIREMENTS.

The water requirement of the crop varies greatly in the different districts, mainly owing to the difference in soils. On the whole it is justifiable to say that more water than is necessary is used for potatoes by even the best growers. On light soils, the normal practice is to irrigate the crop 10 to 12 times. In some villages, even more irrigations are given. At the Central Experimental Farm, Morphou, three to four irrigations were usually found to be sufficient, but the soil is somewhat heavier than the majority of potato soils. It is not possible to generalize on the subject of irrigation practice for potatoes beyond the statement that once the crop is established irrigation should not be necessary at more frequent intervals than once in 10 days. A maximum of six irrigations should prove sufficient.

SEED POTATOES.

The average quantity of seed potatoes sown per donum is 120 okes with a maximum of 200 okes.

1. *Origin*.—The question of seed is most important in the potato crop, more so than in most other crops. No matter how carefully the crop is cultivated and manured unless good seed is planted the yield will not be high.

What is "good seed". If one obtains a sack of "certified seed" from the United Kingdom and plants the seed in Cyprus the first crop will be a good one; if seed is saved from this crop and replanted under identical conditions the yield will fall and if further crops are planted from the same stock there will be a progressive degeneration until the yields become quite uneconomic. This degeneration is due to the progressive infection of the stock with virus diseases which are carried from plant to plant by aphids (green flies). The only method of avoiding this degeneration is to obtain seed from places where the aphids are less common. The necessary conditions are found in parts of Scotland and Ireland and that is the reason why "Irish seed" is recommended as being best for Cyprus. All Irish seed imported into Cyprus must have been inspected by Government Inspectors in Ireland before being exported so that buyers may be assured that it is sufficiently free from virus to give a good yield.

In the event of Irish seed being unavailable owing to war conditions and it becomes necessary to use Cyprus seed, care should be taken only to buy seed saved from once or twice grown Irish seed.

2. *Variety*.—The variety Up-to-Date has for a long time been the only variety cultivated in Cyprus. Seed of this variety is becoming less and less available as Irish growers are finding better varieties. The varieties Majestic and Arran Banner may be recommended as having given good yields in trials here—in some cases outyielding Up-to-Date.

CULTURAL DETAILS.

1. *Preliminary Cultivation.*—Cultivation for the February planting starts in the previous October, when the land is given the first ploughing. The rains usually fall heavily in the months of November, December and January and it should be the object of potato growers to plough the land between 1 and 3 times more during these months. These preliminary ploughings will depend on weather conditions, but, if it is possible to carry them out satisfactorily, the land will receive the utmost benefit from the rain and weeds will be got well under control. The cultivation for the August planting varies in different localities. Two or three ploughings should be done in June and July and it is usually necessary to flood the land once or twice in order to bring it into condition for ploughing.

2. *Sowing.*—When the preliminary ploughings have been completed, it is necessary to ridge up the field. This operation is best carried out by a ridger, but, with a little more trouble, good ridges can also be produced with a plough. As subsequent irrigation will be carried out along the ridges, it is necessary to have them running in the correct direction for each field. In the February planting it is usual to lay the seed along the furrows formed between the ridges, then to apply the fertilizer close to the seed and finally to run the plough down the centre of the ridge, thus splitting the ridge and covering the seed. After planting, therefore, the final ridges will stand where the furrows had previously been after the preparatory ridging. In the August planting, it is usual to make the ridges with greater care, finishing off by hand, and to push the seed with the help of a hoe well into the side of the ridge. In this case the ridges are only made once and are not subsequently split. It is, however, possible to see both methods of planting in use both in February and August, the first method being quicker and more suited to large areas and the second method being better suited to small areas especially where irrigation water must be conserved.

Seed potatoes are usually small in size and can either be planted whole or cut. If cut, each piece should have 2 or 3 good eyes on it and it is unwise to attempt to save seed by sowing too small pieces. However, there is no need to sow whole potatoes unless they are so small that cutting is not desirable.

3. *Subsequent Cultivation and Irrigation.*—The seed should receive an irrigation soon after sowing and subsequent irrigations should be given as previously described. As soon as practicable after each irrigation the land should be hoed in order to conserve moisture and keep down weed growth. The young shoots will appear after a week or so and vegetative growth is rapid. About six weeks after sowing the plants should be earthed up by hand and a second earthing-up may be necessary later on.

4. *Harvesting.*—When the crop is ready for harvest, the foliage begins to dry up. The potatoes should not be lifted until they possess a skin thick enough to stand the operation without damage. Lifting can be carried out by hand, in which case the potatoes are dug up with a fork, or by a plough. The plough is more likely to cause damage to the crop and may leave a fair percentage in the ground, but it is both quicker and cheaper. After lifting potatoes are usually stored in a pit and covered over with earth till required,

PESTS AND DISEASES.

The worst pest of the potato is the Lita moth (*Phthorimaea operculella*, Zell). This insect is common about the time when the summer crop is lifted (i.e. about May) and will lay eggs on any potatoes exposed to the air. The eggs hatch into a grub which burrows within the potato tuber and completely destroys it for seed purposes. For this reason it is essential that seed saved from the summer crop for planting in August should be stored in sand in order to protect it from this insect.

Under certain conditions especially in spring when the weather may be warm and humid, the crop may be attacked by Potato Blight (*Pero-nospora* of Potatoes). In this disease the leaves become blackened and die and from the underside of the leaf springs light white fur which is the reproductive bodies of the fungus responsible for the disease. As soon as this appears, the crop should be sprayed with Bordeaux mixture.

Rotations of Crops.

An efficient rotation of crops under Cyprus conditions implies the utilization to the best advantage of available land and water supplies.

LAND WHERE IRRIGATION WATER IS NOT AVAILABLE.

Where irrigation water is lacking, the variety of crops that can be grown is very limited. Under present circumstances, the only important crops are winter cereals (wheat, barley and oats) and winter legumes (vicos, louvana and broad beans). Broad beans (koukkia) usually need at least one irrigation, but can be grown without irrigation in districts where the soil retains moisture for a long time.

The most common rotation is :—

1st year, wheat ; 2nd year, fallow.

This is sometimes modified into :—

1st year, wheat ; 2nd year, barley ; 3rd year, fallow.

These two rotations should, whenever possible, be modified by the inclusion of a leguminous crop in place of the fallow. This is not always possible and, particularly in areas where the main value of the fallow lies in its capacity for retaining moisture for use in the next crop, may cause the yield of the following cereal to decrease, but in many cases it will enable a greater quantity of produce to be taken off the land. Louvana (*Lathyrus ochrus*) is the best legume for dry areas, followed by vicos (*Vicia sativa*) and rovi (*Vicia ervilia*). Broad beans (*Vicia faba*) should, as already stated, only be grown where the soil retains sufficient moisture or in areas where flooding from river waters is possible in spring. Rotations including legumes will then be :—

1st year, wheat ; 2nd year, legume ; or

1st year, wheat ; 2nd year, barley ; 3rd year, legume.

LAND WHERE IRRIGATION WATER IS AVAILABLE.

Where irrigation water is available, it is possible to grow a great many crops. In the present emergency, the largest area possible should be put under food crops and this will limit the number of possible rotations. In choosing a suitable rotation for any particular holding or farm, the following factors must be considered :—

- (a) The area of land available.
- (b) The type and fertility of the soil.
- (c) The amount of water available for irrigation.
- (d) The months during which water will be available for irrigation.
- (e) The quantity of water in relation to the extent of land available.

In addition to these factors, the correct sequence of crops must be followed and attention must be paid to manuring. The various points will be illustrated in the following suggestions for rotation of crops under two conditions where summer irrigation water is available.

I.—The land is of medium fertility and sufficient irrigation water for a small part of the land, say, one-eighth of the area, is available all the year round. Capital is lacking and the crops are grown for home consumption as well as sale of the surplus. The rotation consists of crops that are cheap to produce and has a high percentage of restorative crops.

1st year.—Wheat.

2nd year.— $\frac{1}{2}$ cowpeas (early summer), $\frac{1}{2}$ haricots (late summer).

3rd year.— $\frac{3}{4}$ barley, $\frac{1}{4}$ oats.

4th year.— $\frac{1}{2}$ loubana, $\frac{1}{2}$ vetches.

In the fourth year the land can also be fallowed or the leguminous crops ploughed in as a green manure while they are still at the vegetative stage.

Potato crops can be grown in place of the cowpeas and haricot beans, but in this case care must be taken to apply sufficient manure.

II.—Abundant water for irrigation is available at all times of the year. The soil is very fertile, deep and has good physical properties which make cultivation easy.

Suitable implements, fertilizers and seed, can be purchased and extra labour obtained when required. The rotation followed will, therefore, aim at making the most of the resources available, the fertility of the soil and the abundance of the water. A rotation as follows would be suitable :—

1st year.—Wheat, barley, oats, followed by haricots.

2nd year.—Vicos as green manure, followed by early potatoes (planted February).

3rd year.—Winter legumes (vetches, beans and peas) for seed, followed by late potatoes (planted August).

4th year.—Vicos as green manure, followed by cowpeas.

This rotation may be modified by growing cotton or onions in the second year or by the introduction of various crops suitable to different localities.

The two examples quoted may serve as guides to rotations that may be followed in different circumstances. Each holding must be considered separately and further generalization would not be of assistance.

Irrigation of Field Crops.

INTRODUCTION.

CYPRUS agriculture depends very largely on irrigation. The rainy season on the plains normally extends from November to March, inclusive, and crops grown wholly or partly outside this period usually need artificial watering. Even winter crops grown during the rainy season are irrigated whenever possible from the periodic torrents that follow heavy rain. The main objects of irrigation are to increase the yield of crops suffering from insufficient natural moisture and to extend the period during which the land is productive. The competent cultivator can go a long way towards meeting both these objects without the necessity of applying water to the land and the methods by which he does so may be collectively termed "water conservation". The ways in which water can be conserved are summarized briefly below. It must be borne in mind that each method outlined is only suitable under certain circumstances and it would be unusual to find a piece of land in which all methods could be applied.

(a) *Reducing Run-off.*—Sloping fields may tend to lose water too quickly. Various methods to reduce this rapid loss of water, which is usually doubly harmful in that it also removes soil, have been evolved and the main ones are terracing, contouring and strip cultivation. Details of these methods will be found in the "Report on Soil Erosion in Cyprus," by A. Pitcairn.

(b) *Preliminary Cultivation.*—After ploughing, land is in a better state to absorb and retain rain water than when it is uncultivated. Accordingly, land should be ploughed up before it becomes too hard in order that it can get the maximum benefit from the next rains.

(c) *Cultivation after Sowing.*—The effect of rainfall will be prolonged if the surface of the soil is hoed or otherwise cultivated when the crop is growing. The main advantage of this cultivation is the reduction of weed growth which competes with the cultivated crop for the possession of the water in the soil.

(d) *Special Cultural Methods.*—Crops are sometimes planted at the base of furrows, for example unirrigated cotton, and trees are often grown in basin-shaped depressions in order to collect all the available moisture.

WATER SUPPLIES.

In Cyprus, the supply of water for irrigation is well behind the demand. For summer irrigation, the main sources of supply are springs, chains of wells and wells. In springs and chains of wells, the water appears at the surface of ground without further attention from the farmer, but with wells, the water must be raised to the surface by some mechanical means. The methods of raising water most frequently seen are windmills, *alakatis* and, increasingly frequent, engines and pumps. In all cases, the water available for summer irrigation is of great value and, for this reason, must be put to its best possible use.

METHODS OF BRINGING WATER TO THE LAND.

When the fields to be irrigated are close to the source of the water, there is no difficulty about bringing the water to the crop, but when they are more or less distant the question becomes more complicated. The most usual and apparently least expensive way is to lead the water to the field in open earth channels. This practice may lead to very great losses of water due to seepage. These losses are particularly large when the channel is used intermittently and the earth has the chance to dry and crack. Concrete channels will reduce losses of water to negligible proportions, but the cost may be great. It is, however, a common fault to see concrete channels made too large in capacity, with walls thicker than necessary, and if careful thought is given to the quantity of water which must be carried, channels of the correct size can be made and economies effected. Attention should also be given to the possibility of pumping through iron pipe-lines either fixed or movable.

METHODS OF APPLYING WATER TO THE LAND.

The only method of applying water to the land that is of importance in Cyprus is flow irrigation. On certain plantations there are examples of overhead irrigation and irrigation from underground mains, but the capital cost will probably prevent these systems from spreading. Flow irrigation consists of guiding a flow of water where required and skill in the operation enables the maximum quantity of land under any given crop to be irrigated effectively and evenly from a given quantity of water. Skill in irrigation can only be acquired by practice, but the following points may be of assistance :—

1. Fields to be irrigated should be nearly level, having a slight slope in one direction. Fields with steep slopes should be terraced.

2. Summer crops requiring irrigation should be grown on ridges or in small plots with banks of earth 4" to 6" high between each. With ridged crops, the irrigation water can run along the ridges which must have cross sections at intervals depending on the slope of the land. The size of plot, when the crops are grown on the flat, also depends on the slope of the land. Plots should be laid out in such a way that irrigation will be even and there will be no harmful washing of soil on steep slopes.

3. The irrigation water should be applied to land slowly and carefully. This implies that each man irrigating must not have a greater flow of water to control than he can deal with easily. Depending on the different summer crops grown, a good irrigation labourer can deal with a flow of between 4,000 and 7,000 gallons per hour and will, on the average, irrigate two donums in a 10-hour day. When cereals are flooded in winter from the periodic torrents, much larger flows of water are dealt with and a man will irrigate on the average 5 donums a day from a flow of 25,000 gallons per hour. In this case a large volume of water must be dealt with in the minimum time and, although theoretically there are innumerable objections, in practice there is little that can be done towards improving the local method. This practice of uncontrolled flooding must on no account be applied to summer crops.

4. In general the following principles may be laid down :—

- (a) Irrigate frequently and lightly rather than infrequently and heavily. Heavy irrigations usually lead to unnecessarily large losses of water by drainage beyond the area served by the roots of the crop.
- (b) Wet soil should not be irrigated. The soil should always be allowed to become comparatively dry between irrigations.
- (c) In the present emergency, cultivators are advised to plant where possible a somewhat larger area of summer crops and irrigate them proportionately less. In some cases the average yield will not decrease and may even increase, and in the large majority of cases the total yield of produce from the same water supply will be greater than in previous years.
- (d) As soon as is practicable after each irrigation, the land between the drills should be hoed. This will destroy weed growth and will prevent the soil from cracking, in this way making the effect of the irrigation last longer.

GENERAL PRINCIPLES.

It is estimated that the average water requirement of summer crops in Cyprus is 10,000 gallons per donum per week during the active growing period. On light sandy soils, weekly or even more frequent irrigations may be necessary, but care should be taken not to give too much water at each irrigation. Similarly, heavy soils may need irrigations only at intervals of 2-3 weeks or even more, but in these cases, heavier irrigations are necessary. Larger quantities of water will undoubtedly give higher yields in the case of many crops, but this increase is usually less in proportion to the extra water required. Water requirements of various crops will vary greatly in individual cases and the figure given above must be accepted with caution, but it should be the rule of all cultivators to try and raise their summer crops on as little water as possible and in this way increase the irrigated area.

It should be possible to grow at least two summer crops per year from each water supply that persists throughout the year. An early crop can be grown within the period February to June and a late crop from July to November. Crops that require water from May to September should be avoided as growing them will lead to water supplies being unused both before sowing and after harvest. Attention is directed towards cowpeas and potatoes for early summer crops and haricot beans and late potatoes for later summer crops, cultural details of which are given in other articles of this series.



Notes on the Management of Dairy Stock and Poultry.

THE feeding of breeding and milk producing animals is of the greatest importance, for upon this depends the success or failure of the farmer to obtain the greatest profit from his sheep, goats or cows. The following notes may assist farmers to improve the conditions under which their milking animals are kept.

VALUE OF TETHERED GOATS.

Dairy cows require more food and more careful management than do sheep and goats, but in areas where there is a demand for a regular supply of liquid milk and cheap foodstuffs are available they are undoubtedly profitable. Goats, of the true dairy type, may be called the poor man's cow. This type should be encouraged, provided that grazing is controlled and adequate hand-feeding is given. They are much cheaper to feed than cows and could provide a supply of milk in every house for children and mothers.

GET RID OF POOR MILKERS.

The improvement in production of sheep and goats may be assisted by the elimination of those old or poor animals which give little milk but eat as much as the good ones. It should be every flock-owner's aim to keep only the profitable ewes, since 25 well-fed sheep could give as much milk as 35 poor or inadequately fed ones.

PROVIDE ADEQUATE FOOD.

Every farmer should endeavour to produce sufficient food for his milking animals on his own farm; this includes:—

- (a) Good quality grain.
- (b) Good clean cereal and vetch straw.
- (c) Oat and vetch or lucerne hay.
- (d) Green food, during most of the year.

Cereal grain and straw should be carefully stacked in the field and on the threshing floor to minimize damage by rain after harvest has begun. Mouldy straw, caused by rain, should not be fed to animals.

VALUE OF HAY AND GREEN FOOD.

Oat and vetch hay gives a valuable fodder, of higher feeding value than straw. The crop should be sown not later than November, using a mixture of 2 parts vetch to 1 of oats. It should be cut when the vetch is flowering or just beginning to seed and should be very carefully dried but not so that the leaves lose all their green colour. Lucerne hay may be made during the summer before it is in full flower, and requires only two or three days to dry to avoid loss of leaves through excessive dryness. Hay should be carefully stored in a shed or room.

Green fodder is invaluable to all breeding and milking stock. During winter green food in the form of natural pasture, which, however, is often limited, green cereal crops, and wild leguminous plants and grasses is available throughout the Island but during summer and especially autumn (October–December), there is practically no green food except that grown under irrigation, and this is strictly limited owing to the preference given to the growing of food for human consumption. However, lucerne is such a valuable crop during summer that every farmer should endeavour to grow a small area, say $\frac{1}{4}$ or $\frac{1}{2}$ donum at least, for feeding to his goats and sheep or cows and young growing stock. Maize is also a useful crop which gives a large amount of food in a short time and can be

grown up to September and October. Maize and cowpeas can be grown on land flooded by late rains (May-June) without additional irrigation. Lucerne will survive for 6 to 8 years but makes little growth during the winter.

FEEDING FOR MILK PRODUCTION.

Concentrate Ration for Milking Animals.

Dairy cows and goats require a daily ration of grain, in addition to forage and grazing, to enable them to keep up their milk yield and to stimulate an increased production. An average sized dairy cow requires 140 to 160 drams of "concentrates" per oke of milk ($3\frac{1}{2}$ to 4 lb. per gallon) produced depending on circumstances. A suitable and reasonably cheap mixture would be:—

1 part (by weight) oats.

1 " " sesame meal.

1 " " bran.

$\frac{1}{2}$ " " crushed carobs or barley.

$\frac{1}{2}$ " " beans or vetches or cotton seed.

"Tethered" goats require $\frac{1}{2}$ to 1 oke "concentrates" per day, consisting of barley, bran and beans. Goats, however, like all sorts of scraps such as vegetable waste or fruit and leaves.

CALF REARING.

The common practice of allowing calves to suckle their mothers before or after they have been milked is definitely bad and has arisen partly through ignorance and partly because it is the easiest method and gives the least trouble. It is a bad practice to allow calves to suckle because, firstly, it means that milking is incomplete and may cause udder troubles, secondly the richest milk is that which is drawn last from the udder, and thirdly the calf gets an unknown quantity of milk and may consequently be overfed or underfed. Pail feeding means the systematic feeding of a known quantity of milk—this quantity should not be less than 4 okes per day until the calf is 2-3 months old. If this method is begun 3-4 days after the cow calves little difficulty should be experienced, but the calf must be completely removed from the cow.

MANAGEMENT OF POULTRY.

1. Poultry houses should be constructed with ample ventilation and in such a way that they are easily cleaned. Movable perches should be provided, their feet standing in tins, to prevent tick infestation.

2. Poultry houses should be cleaned out regularly and the manure collected and used as it is especially rich. Boxes or nests with straw for the hens to lay their eggs in are desirable. If many hens die in a short period it is probably because of infection caused by the dirty conditions under which disease germs multiply rapidly. All dead birds should be burnt or buried and never thrown out on the manure heap or in the yard.

3. Clean water should always be provided in the yard. This should be changed and the water container cleaned out every day.

4. Barley alone is not the best grain for laying birds; wheat and oats are better and a mash made with bran and vegetable and meat scraps should be given.

5. In order to have hens capable of laying a greater number of eggs you should obtain eggs either from the Government Stock Farm or nearest stud stable and keep the best cockerel to mate with your hens.

The Feeding of Livestock,

WITH SPECIAL REFERENCE TO THE USE OF CAROBS.

THE proper feeding of livestock is fairly well understood in Cyprus, especially in those areas where conditions favour the keeping of stock, *e.g.* in the Mesaoria. In cereal-growing areas foodstuffs are usually cheap and plentiful and stock are usually well developed but in the hilly regions, where this is not always the case, the animals are often stunted in growth and of poor conformation and appearance. The staple foodstuffs for livestock in Cyprus are barley and vetches; other foodstuffs used, include oats, bran, cotton seed and beans. Fodder is supplied practically only in the form of straw—though small quantities of green food are available at times. Approximately $\frac{2}{3}$ of the Island's production of barley is fed to livestock. During the coming months and possibly 2 or 3 years, it may be essential to reserve much of the barley for other purposes or economize in its use. It is therefore necessary to devise suitable rations, based on the minimum quantity of barley but using other foodstuffs instead.

CAROBS AS A SUBSTITUTE FOR BARLEY.

Barley is an energy supplying food, especially fed to horses, mules and donkeys, and its composition is very similar to that of carobs. The carob crop of Cyprus is generally exported, chiefly to England, where it is used in the manufacture of compound feeding "cakes" or "meals" which are fed especially to cattle and poultry. In the kibbled form in which it is exported, however, it is perfectly suitable for feeding in Cyprus to horses, mules and donkeys in place of part of the barley ration commonly fed. Whole carobs can also be used where these are easily obtainable, but they should be broken up by hand in smaller pieces and should not be fed quite so liberally as the kibbled product.

CAROBS AS A FEED FOR HORSES, MULES AND DONKEYS.

Carobs may be fed in place of $\frac{1}{3}$ to $\frac{1}{2}$ of the barley ration of horses, mules or donkeys. Thus a horse or mule used for regular work which ordinarily is fed a daily ration of 3–4 okes of barley should be given:—

$1\frac{1}{2}$ to 2 okes barley; $1\frac{1}{2}$ to 2 okes carobs mixed with the usual ration of straw.

Furthermore to economize the use of barley—a quantity of oats can be used, especially to donkeys. Thus for horses and mules a suitable ration would be:—

$1\frac{1}{2}$ –2 okes carobs; 1 oke oats; 1 oke barley; total $3\frac{1}{2}$ –4 okes per day.

Similarly donkeys fed normally a ration of 1–2 okes of barley should be fed:—

$\frac{1}{2}$ to 1 oke carobs; $\frac{1}{2}$ to 1 oke of oats or barley.

FEEDING OF WORKING CATTLE.

The usual rations fed to working oxen or cows consist of vetches, cotton seed and oats in addition to straw. Barley is only used in small quantities. The normal ration is probably adequately balanced and little improvement to the rations used in the Mesaoria can be recommended except in as far as barley is used and then this should be replaced by oats or carobs. In hill districts it is doubtful if more than a small percentage of the cattle are fed on anything other than straw. A small quantity of broken carobs would form a most useful addition to this limited diet, as it would make the straw much more palatable.

FEEDING OF PIGS.

The feeding of pigs varies considerably according to the locality. In Paphos District, for example, acorns, terebinthus seed, etc., which are suitable for pig feeding are regularly used, whereas in the Mesaoria, barley and whey from the cheese-making establishments are used. Bran and green food are used in most districts but the commonest practice is to graze the young pigs out of doors, giving only a minimum of concentrated food (e.g. bran or barley) and then finally to fatten them on a liberal quantity of barley or barley flour and whey. Carobs have been successfully used at the Government Stock Farm, Athalassa, in the past, provided that they are not fed in large quantities. For fattening pigs, therefore, crushed or kibbled carobs, bran and barley meal should be fed in approximately equal quantities with whatever whey is available. It is not advisable to feed carobs entirely in place of barley meal.

FEEDING OF DAIRY COWS.

As part of the ration of dairy cattle kibbled carobs in small quantities are admirable, and have been fed to the dairy herd at the Government Stock Farm now for over three years. Two convenient rations for dairy cows are as follows :—

(A)	(B)
1 part of <i>gousvos</i> (sesame meal).	1 part of <i>gousvos</i> (sesame meal).
1 „ of cotton seed.	1 „ of beans or vetches.
1 „ of bran.	$\frac{1}{2}$ „ of bran.
$\frac{1}{2}$ „ of carobs.	$\frac{1}{2}$ „ of carobs.
$\frac{1}{2}$ „ of oats.	1 „ of oats.

IMPORTANCE OF FEEDING COWS ACCORDING TO THEIR MILK YIELD.

The principles underlying the feeding of dairy cows in milk are not generally appreciated by dairymen in Cyprus. The essential point is that cows should be fed the grain ration according to their milk yield and not in equal amounts irrespective of their yield. The ration of straw, green food, hay or grazing is usually reckoned to supply the cows' maintenance requirements, i.e. the food necessary to keep her in health without producing milk, extra flesh or a calf. The grain or "concentrate" ration is required to produce these, and should always be fed in controlled amounts. If maintenance requirements are adequately provided for, then the following amounts of food are necessary for milk production. For every oke of milk produced 150 drams of concentrates are required; therefore for 4 okes milk, $1\frac{1}{2}$ okes of concentrates are required. Thus a cow yielding 17 okes should get $\frac{17 \times 150}{100} =$ nearly $6\frac{1}{2}$ okes per day, and a cow yielding 7 okes should get nearly $2\frac{3}{4}$ okes. If, however, the maintenance ration is not considered to be enough (i.e. if only straw and a little green food is available) then an extra $1-1\frac{1}{2}$ okes of concentrates should be fed to all cows equally. It should be remembered, however, that cows of equal size can only digest approximately equal quantities of food and therefore high-yielding cows, consuming $6\frac{1}{2}$ or more okes should be given less straw which tends to fill them up without having much nutritive value. To get the best results from dairy cows, individual attention and skill in feeding is necessary. Foods must be palatable and a sure way of making them so is to include carobs. 10-15% of the concentrates might always consist of carobs and a larger quantity can be used in place of barley. The two rations given above illustrate this,

VALUE OF HAY IN FEEDING STOCK.

Very little hay is made in Cyprus, probably both because its value is not fully appreciated and because there is no natural grass-land from which to make it.

The value of hay lies in the fact that, provided it is cut before seeding takes place, the crop retains in the leaves and stems more food value than is found in straw, and it is indeed much more nutritious and palatable. Hay-making must therefore be done when the crop is still green and fresh—that is before it is in full flower, and, it must be dried as quickly as possible in order to avoid excessive loss of the green colour through over-drying.

The most suitable crops for hay-making in Cyprus are oats, oats and vetches (vicos), or lucerne. Farmers are urged to grow a small area of hay this year, in order to give it a trial as a fodder for their animals when grazing or green food is particularly scarce. The value of lucerne is well recognized in the Island, chiefly as a source of green food in summer and for this reason as well as its use as hay the cultivation of lucerne should be extended as much as water supplies permit.

The Conservation of Farmyard Manure.

THE proper preservation of farmyard manure is not appreciated in Cyprus and the locally-made product is a poor substitute for properly made well-rotted manures. In view of the possible shortage of imported chemical fertilizers it is well to consider in what ways farmyard manure can be increased in quantity and quality.

Animal manure is also responsible for breeding flies and the proper disposal of this product will also safeguard public health.

WHAT IS FARMYARD MANURE ?

Farmyard manure is generally understood to consist of : (a) the solid excreta of animals, (b) the urine, and (c) the bedding or litter used in the stables.

Half of the solid matter in the food given to animals reappears in the dung and contains about three-fourths of the total nitrogen and nine-tenths of the phosphates and potash, contained in the food, these three substances being by far the most important for manurial purposes; of the nitrogen and potash that is passed through an animal a larger proportion is found in the urine than in the dung and the reverse is true of the phosphates.

Hence the urine is shown to be of especial value. Farmyard manure is deficient in phosphates in relation to the amount of nitrogen and potash it contains, but it is of special value in supplying organic matter to the soil, and in improving the texture of heavy soils.

LOSSES IN FARMYARD MANURE.

Even when well-stored, manure loses some of its valuable plant food before becoming available to the crops, and under bad conditions of storage or making these losses may be very considerable.

The greatest loss is through the escape or lack of collection of the urine. This is far richer in plant food than the solid dung and its use is of the utmost importance.

The second cause of loss is by fermentation leading to the escape of ammonia. This is brought about by allowing manure to remain exposed to the air and to become dry, when the losses may then be very great,

Thus it is obvious that the proper collection and storage of all manure, including urine, is of extreme importance in order to obtain the best results from it in the field.

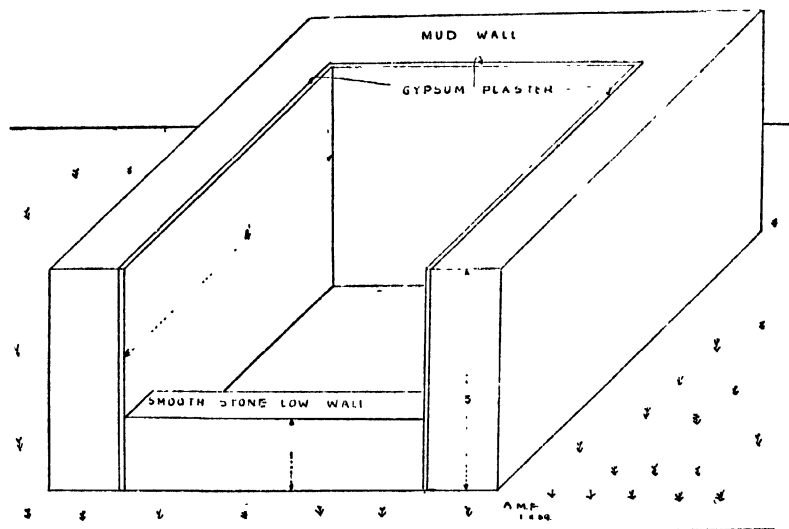
PREVENTION OF LOSSES IN STORAGE.

It should be readily obvious from the foregoing that the common methods of "storing" manure in Cyprus are extremely bad and must lead to big losses of nitrogen, phosphates and potash. It is clearly to every farmer's advantage, therefore, to take the following steps to conserve manure as well as possible and thus, by increasing its quality, he will be able to manure a larger area of land, by applying it in smaller quantities per donum. It is of the first necessity, therefore, to have a suitable pit or storage place, which (1) can take all the manure produced, including the urine and litter, and (2) is as sheltered as possible from excessive exposure to sun, rain or flooding.

In addition the manure must not be thrown carelessly into this pit or storage place, but must be systematically filled in, with litter, sweepings or rubbish and be so placed either that urine can be run into it or collected in empty petrol tins and poured on to it.

HOW TO CONSTRUCT A MANURE PIT.

The simplest answer to this is to select the driest corner of the yard, preferably against an existing wall, and build a second wall so as to enclose three sides of a square.



The walls should preferably be plastered with gypsum to prevent fly larvae penetrating the existing mud-wall, and across the open entrance a smooth stone ridge—1 ft. high—should be built for a similar reason, and all manure put well inside this low wall.

Alternatively a pit 3 feet deep and of convenient length may be dug and if the soil is not sufficiently hard or rocky, then the pit should be lined either with lime concrete using a minimum of cement or with masonry, if possible a lean to roof should be constructed. The

essential point is to avoid having sides of soft earth in which fly larvae can burrow ; but a simple well dug pit is better than no pit at all. It is essential that this pit should not be liable to flooding and that all drainage water should be led away from it. For shelter the wall or sides themselves partially ensure this but any simple covering or roof that can be put up cheaply and easily is worthwhile. If such manure is made two or more pits are better than one—so that each pit can be covered with earth when filled until it is time to cart it out to the fields.

COLLECTING THE LIQUID MANURE.

This may be done either by constructing a simple channel from the stable to the pit or by placing a petrol tin at the point where all the liquid manure runs out of the stable or collects in the stable, and then to transfer the contents of the tin to the pit.

POULTRY MANURE.

It is not generally realized how valuable poultry manure is, and that it contains about $2\frac{1}{2}$ times as much nitrogen and phosphate as an equal amount of ordinary farmyard manure.

It has been claimed that 20 hens properly housed and fed will produce in a year 500 okes of manure and that 120 okes are sufficient dressing to apply per donum.

The manure should therefore be stored separately from other manure as it is so much richer and more valuable. It is also desirable to keep it quite dry so that it can be more easily spread over the land than if it is wet, when it becomes a sticky mass. If a little gypsum is mixed with the fresh manure, by sprinkling it over it, it will dry quickly and keep well ; alternatively sandy soil may be used for this purpose. It is also advantageous to break up the manure as finely as possible before applying it to the land, in order to get even distribution.

Farmers will readily appreciate from this information, the great value of poultry manure, and considering the ease with which it can be collected and stored, in a shallow pit, it will be to their advantage to collect as much of it as they can during the coming year.

Compost-Making.

THE manufacture of compost is a way in which all surplus garden refuse, weeds, straw and other cellulosic vegetable matter can be transformed into a valuable organic manure at low cost. Woody materials, such as cotton stalks, cannot be utilized for this purpose as they take too long to decay.

Compost can be made in heaps, above ground, or in pits, but in Cyprus a pit is preferable. The pit may be 4' deep and about 10' square, but should suit individual requirements. It must not be deeper than 5', as this will stop the aeration of the manure which is essential for decomposition. Compost pits should preferably be lined with concrete and be covered, but this may be too expensive for the average farmer and is not essential.

The pit is filled up as follows: Firstly a layer of refuse or straw, broken up or chaffed as much as possible and thoroughly wetted, is placed on the bottom of the pit to a depth of about a foot. On top of this layer is placed 3"-6" of partially decomposed stable manure if available. If farmyard manure is not available, the same results can be achieved by using a layer of mixture of artificial manures, such as follows:—

6 okes lime, 4 okes ammonium sulphate and 2 okes superphosphate
per 1 foot layer of refuse 10' x 10',

The remainder of the pit is built up in layers as described above. The art of compost-making lies in seeing that the material is kept moist, but not waterlogged and is kept aerated. When the pit is half full, the material should be turned and rewetted if necessary. Similarly the second half of the pit should be turned when the pit is completed. It may be necessary to spray water on the pit and re-turn the material from time to time during the period of decomposition. Complete decomposition will take from 4-6 months, after which the material is ready for use.

When the pit has been filled, it should be covered with a layer of soil 4"-6" thick and protected from heavy downpours, which will cause waterlogging.

Manufacture of Olive-Oil.

MAKING good olive-oil is not a very elaborate process, but it is one which requires labour, constant care and attention and the observance of certain principles. Unfortunately methods of manufacture in Cyprus are generally primitive with resultant loss in yield, and the lack of care in the handling of olives and olive-oil are the cause of large quantities of inferior oil appearing in the market. Every single stage in the manufacture of oil should be carefully watched and cleanliness should be observed throughout if the oil is to be of good quality needing no further refining.

The method of picking and storing the olives has an important effect on the quality of oil. The thing to remember is that injured olives, which have picked up much dirt from the soil and then stored in large heaps on damp floors, are excellent breeding places for micro-organisms which will cause fermentation and lower the quality of the oil. If olives are to be kept only for a few days before sending to the factory a slight amount of bruising is of no consequence, but they must be stored on dry floors in shallow layers. Concrete floors are not recommended as they may impart a peculiar odour and taste to the oil. Dry wooden floors are the best. If storage in shallow layers is not possible the olives may be stored in brine, but storage in heaps is always to be avoided. It is a good principle always to send the olives to the factory immediately after picking. If olives are picked very ripe, the oil produced will contain a large amount of solid fat which will cause solidification in winter time.

It is advisable to wash the olives before crushing. Small amounts of impurities may have a large detrimental effect on the quality of oil. (There is a rotary washer which is giving good results at Ayios Amvrosios. It is of simple construction and efficient.) Leaves and twigs should be removed as they tend to impart an unpleasant flavour to the oil. Injured and infected olives should be separated from the sound ones. If required, they may be used for oil production but the oil must not be mixed with that produced from sound olives.

It is the practice in many districts to boil the olives and then store them in large heaps for over a fortnight before extracting the oil. This practice results in the oil produced being of dark colour, high acidity and liable to rancidity. The sooner it is given up the better.

At the factory the olives are crushed before pressing. This is done with a stone-wheel revolving in an iron bowl. The modern edge-runner used in many mills is very efficient and should be adopted whenever possible.

Pressing the paste produced by crushing is done either by the old fashioned screw-press or by hydraulic press. The paste is placed in rush baskets which are put one over the other in columns of 15-20. These baskets cannot withstand the pressure of the hydraulic press and the

paste in such a case is put into heavy folded cloths which are placed in columns of 20-30. Hydraulic presses can extract much more oil from the paste than the screw-press.

After the first pressing the paste in each basket is stirred, boiling water is added and more pressure applied. The oil so produced will tend to solidify more easily than that obtained first, but as a rule its quality is good enough and it may be mixed with the first. The cake may be crushed again and a fresh lot of oil of inferior quality may be extracted by adding hot water and pressing. But in general the cake is sold to factories for the production of sulphur oil.

The liquid extracted is a mixture of water, plant material and oil. On standing in galvanized iron tanks the oil soon comes to the top and is removed. The liquor is run into big tanks and after settling for a further period of 1-2 weeks, some more oil comes to the top and is collected. This oil is generally of inferior quality and is used for soap making. The loss which results from incomplete separation can be avoided by the use of centrifugal clarifier, which separates the oil from the liquor quickly and completely. One such clarifier, which works continuously and can deal with 800 litres of liquor per hour, has been installed at Ayios Amvrosios.

At this stage the oil contains suspended vegetable matter and is allowed to settle for many weeks, by which time impurities settle down and the oil is decanted. It is preferable to filter the oil before storage. All that is needed is a tall tin vessel with perforated bottom and a layer of cotton wool of about one inch thickness. It is a rapid and inexpensive method. It is advisable to repeat the process of filtration after 5-6 months, the cotton wool being more closely packed in the second filtration as finer impurities have to be removed.

The storage should be done in glass vessels or glazed earthenware. Tins should be avoided but if their use cannot be avoided it should be seen that they are not rusty inside. Free fatty acids attack zinc and consequently the use of galvanized iron with oils of appreciable acidity is to be avoided.

It is essential that the machinery and vessels used should be absolutely clean. Oil absorbs bad odours and flavours very readily and their removal is very difficult. In addition dirt is the cause of rancidity and acidity in oil. Before use the machinery and vessels should be washed with 2% hot caustic soda solution or a stronger washing soda solution. The soda is then washed away with clean hot water. The practice of using machinery and vessels which have not been washed perhaps for years is responsible every year for the spoilage of large quantities of oil.

If oils have been spoiled it is possible in most cases to improve their appearance and quality. Removal of disagreeable odours and flavours is more difficult.

The methods employed for reducing acidity and removing disagreeable odours and flavours are generally beyond the reach of the small producer but there is no reason why they should not be adopted by Co-operative Societies. Olive-oil makers are advised to consult the Chemist of the Agricultural Department, Nicosia, on the best methods to employ.

It will be seen from the above that it is easier to produce good olive-oil than to improve the quality of oil that has been spoiled. It is well to remember that appreciable loss in quantity may result from refining. Further, no treatment can bring back the oil to its original quality. If thorough cleanliness is observed from the time of picking the fruit to the time of selling the oil it should not be necessary to resort to refining.

The Editor does not necessarily endorse the statements or opinions expressed in contributed articles, the responsibility for which rests with the authors.

Meteorological Data, Cyprus.**SUMMARY OF OBSERVATIONS AT REPRESENTATIVE STATIONS.
SEPTEMBER, 1939.**

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	93.43	65.90	—	—	—	0.41	—
Athalassa	—	—	—	—	—	0.61	—
Morphou	88.77	64.97	—	—	—	0.18	—
Makhaeras	—	—	—	—	—	0.27	—
<i>Famagusta District :</i>							
Famagusta	94.40	67.60	—	—	—	0.20	—
Akhyritou	91.33	64.63	—	—	—	0.12	—
Rizokarpaso	—	—	—	—	—	0.35	—
Lefkoniko	—	—	—	—	—	0.45	—
<i>Larnaca District :</i>							
Larnaca	89.20	63.80	—	—	—	0.55	—
Lefkara	—	—	—	—	—	0.70	—
<i>Limassol District :</i>							
Limassol	88.77	64.93	—	—	—	0.01	—
Saittas	—	—	0.30	1	0.30	1.19	—
Trikoukkia	78.10	53.37	0.15	1	0.15	1.04	—
Alekhtora	—	—	—	—	—	0.19	—
<i>Paphos District :</i>							
Paphos	76.47	67.23	—	—	—	0.18	—
Polis... ..	—	—	—	—	—	0.38	—
<i>Kyrenia District :</i>							
Kyrenia	87.25	67.78	—	—	—	0.36	—

OCTOBER, 1939.

<i>Nicosia District :</i>							
Nicosia	87.10	60.71	—	—	—	0.50	—
Athalassa	—	—	—	—	—	0.59	—
Morphou	85.10	59.94	—	—	—	0.41	—
Makhaeras	—	—	—	—	—	0.99	—
<i>Famagusta District :</i>							
Famagusta	89.19	61.61	—	—	—	1.30	—
Akhyritou	86.30	59.19	—	—	—	0.94	—
Rizokarpaso	—	—	0.57	2	0.45	0.82	—
Lefkoniko	—	—	—	—	—	0.26	—
<i>Larnaca District :</i>							
Larnaca	85.10	61.03	—	—	—	0.69	—
Lefkara	—	—	—	—	—	1.04	—
<i>Limassol District :</i>							
Limassol	84.93	62.42	0.10	2	0.07	0.84	—
Saittas	—	—	—	—	—	1.30	—
Trikoukkia... ..	69.26	50.00	—	—	—	2.41	—
Alekhtora	—	—	—	—	—	0.85	—
<i>Paphos District :</i>							
Paphos	74.84	65.13	—	—	—	0.55	—
Polis... ..	—	—	0.12	1	0.12	0.92	—
<i>Kyrenia District :</i>							
Kyrenia	82.15	65.18	—	—	—	0.95	—

Note.—Compiled from returns furnished by Public Works Department.

NOVEMBER, 1939.

District and Station	Shade temperature		Rainfall				
	Mean		Total inches	No. of days rain	Greatest fall in one day	Average for 10 years inches	Dates on which snow fell
	Maxim.	Minim.					
<i>Nicosia District :</i>							
Nicosia	70.07	51.07	2.86	7	0.96	1.37	—
Athalassa	—	—	2.41	6	1.18	1.09	—
Morphou	70.57	51.93	3.94	10	0.94	1.31	—
Makheras	—	—	6.08	4	3.15	2.70	—
<i>Famagusta District :</i>							
Famagusta	75.20	53.76	2.25	6	0.90	1.94	—
Akhyritou	71.57	50.53	2.13	6	0.88	1.45	—
Rizokarpaso	—	—	1.61	7	0.57	3.12	—
Lefkoniko	—	—	3.01	6	0.90	1.55	—
<i>Larnaca District :</i>							
Larnaca	71.26	50.93	2.10	6	0.65	1.63	—
Lefkara	—	—	5.73	5	2.50	2.63	—
<i>Limassol District :</i>							
Limassol	72.73	55.27	3.13	8	1.56	1.83	—
Saittas	—	—	6.24	8	3.90	2.50	—
Trikoukkia	55.60	38.23	6.84	9	1.80	2.78	—
Alekhthora	—	—	6.20	7	2.55	2.52	—
<i>Paphos District :</i>							
Paphos	63.07	56.97	5.90	8	1.70	2.69	—
Polis	—	—	3.92	6	1.80	1.83	—
<i>Kyrenia District :</i>							
Kyrenia	71.03	59.20	3.87	8	1.50	2.08	—

Note.—Compiled from returns furnished by Public Works Department.

Short List of Government Publications.

(Obtainable, post free, from the Superintendent, Government
Printing Office, Nicosia, Cyprus.)

AGRICULTURE, FORESTS AND MINERALS.	s.	d.
Agriculture—Report for 1932, 1933, 1934, 1935, 1936 & 1937	3	0
Cupriferous Deposits, by Professor C. Cullis & A. Edge—1927	5	0
Forest Administration Report, 1935, 1936 and 1937 .. (each)	1	0
Forest Conservancy, by P. G. Madon—1930	3	0
Forestry, Summary of Report by R. S. Troup—1930 ..	1	0
Fungi of Cyprus, First List of, by R. M. Nattrass—1937 ..	2	0
Geology of Cyprus, by C. Bellamy & A. Jukes-Browne—1905	2	0
Insect Pests & Fungus Diseases, by H. Morris (T. or G.)*—1932	—	6
Inspector of Mines, Annual Report, 1930, 1931, 1932, 1934, 1935 and 1937 (each)	1	0
Irrigation Work in Cyprus, Report on, by Col. Ellis—1922..	10	0
Mineral Substances Utilized in the Arts, by P. Gennadius—1905	1	0
Soil Erosion in Cyprus, by A. Pitcairn—1937	—	6
Water Supply in Cyprus, Progress Report, half-year ended 31.12.38, by Dr. C. Raeburn—1939	—	4

Agricultural Department Publications.

THE following bulletins and leaflets have been published in English, Greek or Turkish as indicated by the letters *E.*, *G.* or *T.* after each title.

BULLETINS.

Industrial Series :

No. 1.—“The Grape and Wine Industry of Cyprus.” By M. T. Dawe, O.B.E., F.L.S. *E.*

No. 2.—“The Tanning Industry.” By M. T. Dawe, O.B.E., F.L.S. *E.*

Horticultural Series :

No. 1.—“Some Observations on the Citrus Industry of Palestine, with reference to Application of Improved Methods to the Citrus Industry of Cyprus.” By B. J. Weston, M.A., M.Sc., F.R.H.S. *E.*

No. 2.—“Picking, Grading and Packing of Citrus Fruits. A Guide for Exporters.” By B. J. Weston, M.A., M.Sc. (Agr.) *E., G. & T.*

The above two series are now combined and the following have been published :—

No. 3.—“Report on Soil Erosion in Cyprus.” By A. Pitcairn. *E., G. & T.*

No. 4.—“Summary of Agricultural Legislation in Cyprus.” *E.*

No. 5.—“Soil and Water Conservation in Cyprus.” *E.*

Entomological Series :

No. 1.—“Investigations into the Locust Plague in Cyprus.” By Ch. G. Pelagias, I.A. (Gx.), F.A.I. (Gx.), (also *Corrigendum*). *E.*

No. 2.—“A Survey of Olive Pests.” By H. M. Morris, M.Sc., F.E.S. *E., G. & T.* (*T.* out of print).

No. 3.—“Insect Pests and Fungus Diseases of Cyprus and their Control.” By H. M. Morris, M.Sc., F.E.S. *G. & T.* (*E.* out of print.)

No. 4.—“Injurious Insects of Cyprus.” By H. M. Morris, M.Sc., F.R.E.S. *E.*

Mycological Series :

No. 1.—“The Control of Fungus Diseases.” By R. M. Nattrass, B.Sc., Ph.D., D.I.C. *E., G. & T.*

“A first List of Cyprus Fungi.” By R. M. Nattrass, B. Sc. Ph.D., D.I.C. *E.*

LEAFLETS.

No. 1.—“Petroleum Emulsion.” *G.* (Out of print.)

No. 2.—“Boll Worms of Cotton.” *G.*

No. 3.—“Collection, Sorting and Packing of Oranges.” *G.* (Out of print.)

No. 4.—“The Cultivation of the Orange Tree.” *G.*

No. 5.—“Carpocapsa” *G.* (Replaced by No. 22.)

No. 6.—“General Rules for Silkworm Rearing.” *E., G. & T.* (Reprinted, see also No. 8, Educational Series).

No. 7.—“Cultivation of Almond Trees.” *G.* (Out of print.)

No. 8.—“Soil Manuring.” *G.* (Out of print.)

No. 9.—“Control Measures for Red Scale of Citrus.” *G.* (Out of print.)

- No. 10.—“Seed Beds.” *G.* (Out of print.)
 No. 11.—“The Collection of Sumach.” *G.*
 No. 12.—“The Almond Pest (*Eurytoma amygdali*, End.)” *E., G. & T.*
 No. 13.—“Outline of the Rat Destruction Campaign for 1930.”
G. & T. (*E.* out of print.)
 No. 14.—“Potato Tuber Moth.” *E., G. & T.* (Out of print; replaced
 By No. 17).
 No. 15.—“Warble Flies.” *E., G. & T.* (*E.* out of print.)
 No. 16.—“Downy Mildew of the Vine (*Plasmopara viticola*).” *G. & T.*
(E. out of print.)
 No. 17.—“Potato Tuber Moth.” *E., G. & T.* (Replaces No. 14.)
 No. 18.—“The White Rot of Onions in Cyprus.” *E., G. & T.*
 No. 19.—“The Production of Silage.” *E., G. & T.* (Out of print;
 see No. 7 Educational Series.)
 No. 20.—“Importation of Plants, Fruit, etc., into Cyprus.” *E.*
(Reprinted and brought up to date.)
 No. 21.—“*Ceratitis capitata*, Wied. Mediterranean Fruit Fly.”
E., G. & T. Reprint from the *Cyprus Agricultural*
Journal, Vol. XXXI, September, 1936, Part 3.
 No. 22.—“Pests of the Apple Tree.” *E., G. & T.* (Replaces No. 5.)
 Reprint from the *Cyprus Agricultural Journal*, Vol. XXXII,
 December, 1937, Part 4.
 No. 23.—“Citrus Wastage.” *E., G. & T.*
 No. 24.—“Pests of Citrus Trees and Fruit.” *E., G. & T.*
 No. 25.—“The Ox-Warble Fly.” *E., G. & T.* Reprint from the *Cyprus*
Agricultural Journal, Vol. XXXIII, March, 1938, Part 1.

Educational Series :

- No. 1.—“Agricultural Resources of Cyprus.” *E., G. & T.*
 No. 2.—“Breeding, Feeding & Management of Cattle.” *E., G. & T.*
 No. 3.—“Agricultural Calendar.” *E., G. & T.*
 No. 4.—“Linseed (*Linum usitatissimum*).” *E., G. & T.*
 No. 5.—“Sesame (*Sesamum indicum*).” *E., G. & T.*
 No. 6.—“Production of Olives and Olive Oil.” *E., G. & T.*
 No. 7.—“Production of Silage.” *E., G. & T.*
 No. 8.—“Sericulture.” *E., G. & T.*
 No. 9.—“Citrus Fruit Growing in Cyprus.” *E., G. & T.*
 No. 10.—“The Breeding and Management of Sheep in Cyprus.”
E., G. & T. Reprint from the *Cyprus Agricultural*
Journal Vol. XXX, December, 1935, Part 4.
 No. 11.—“Flax.” *E., G. & T.*
 No. 12.—“Diseases of Poultry.” *E., G. & T.* Reprint from the *Cyprus*
Agricultural Journal Vol. XXXI, March, 1936, Part 1.
 No. 13.—“Irrigation in Cyprus.” *E., G. & T.* Reprint from the *Cyprus*
Agricultural Journal, Vol. XXXI, June, 1936, Part 2.
 No. 14.—“Cereal Crops.” *E., G. & T.* Reprint from the *Cyprus*
Agricultural Journal, Vol. XXXII, March, 1937, Part 1.
 No. 15.—“Diseases of Sheep and Goats.” *E., G. & T.* Reprint from
 the *Cyprus Agricultural Journals*, Vol. XXXI, Part 4 and
 Vol. XXXII, Parts 1 and 2.
 No. 16.—“The Cultivation of the Carob Tree in Cyprus.” *E., G. & T.*
 Reprint from the *Cyprus Agricultural Journals*,
 Vol. XXXII, December, 1937, Part 4, and Vol. XXXIII,
 March, 1938, Part 1.

- ### Distribution of Pedigree Stud Animals on 1.1.1940.

There are also 25 boars and 8 goats on loan.

The Horse Breeding Law, 1930. **LIST OF STALLIONS LICENSED FOR 1939.**

		NICOSIA DISTRICT.		
<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Akaki	..	Michael Th. Rafti	..	29
do.	..	Moisis Michael Tchingi	..	203
do.	..	Marikkou Yorgi	..	240
Argaki	..	Polyvios Theophani	..	153
Astromeritis	..	Christoforos Evangeli	..	26
Kalokhorio	..	Yioryis Papaconstantinou	..	262
Lefka	..	Ahmet Dopran Salih	..	255
Lymbia	..	Andronikos Petri	..	32
do.	..	Heraclis Lambi	..	66
Mammari	..	Nicolas Haji Haralambous	..	45
Morphou	..	Vasilis T. Spanos	..	18
do.	..	Andreas Ahapittas	..	249
Nicosia	..	Mehmed Kioutchouk	..	304
Pera	..	Yiannis G. Magou	..	194
Pera Khorio	..	Tofis Michael	..	294
Yeri	..	Yeoryos Petri	..	16
Yerolakkos	..	Haji Michael Haji Loi	..	35
do.	..	Toglis Charalambi	..	22
LARNACA DISTRICT.				
Alaminos	..	Rifat Jumaa	..	260
do.	..	Salih Jumaa	..	64
Aradhippou	..	Costis Kyriakou	..	15
do.	..	Lefteris Towli	..	225
Athienou	..	Costas N. Haji Vrashimi	..	96
do.	..	Vasilis M. Phiakou	..	159
do.	..	Nicolas Vassili Phiakou	..	276
Larnaca	..	Ipermachos Kyriakou Petroladhas	..	288
Voroklini	..	Panayis Theodosi	..	106
do.	..	Ph. P. Haji Philippon	..	267
FAMAGUSTA DISTRICT.				
Akanthou	..	Yiannis Hambi	..	270
Asha	..	Antonis Michael	..	92
do.	..	Christos Haji Lavithi	..	234
do.	..	Kyriakos Antoni	..	239
do.	..	Apostolou Hj. Zanneton	..	274
do.	..	Eleni Demetri Kounalli	..	208
Ayios Andronikos	..	Spyros Yeoryi	..	65
Ayios Elias	..	Constantis Stylli	..	246
do.	..	Yeorgios Christodoulou	..	265
Ayios Seryios	..	Nicolas Yeoryi	..	219
Chatos	..	Ahmet Koja Ibrahim	..	285
Ephatakomi	..	Kyriakos G. Xydonta	..	298
do.	..	Antonis Andrea	..	299
Galatia	..	Akil Mustafa Gonie	..	54
Komi Kebir	..	Kyriakos Constanti	..	68
Kondes	..	Christos Hanni	..	259

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Lefkoniko	..	Mehmed Salih	..	38
do.	..	Christos Haji Symeou	..	241
Lysi	..	Minas Lysandrou	..	80
do.	..	Demetris Tophia	..	227
do.	..	Yangos M. Katsouris	..	301
Melanagra	..	Kallis Kyriakou	..	60
Milea	..	Sotira Panayi	..	284
do.	..	Panayis Loizi Haji Rousou	..	296
Ovgoros	..	Djafer Emin A. M. Mustafa	..	213
Paralimni	..	Andreas K. Xiouri	..	72
do.	..	Nicolas G. Tsiakouras	..	210
do.	..	Avraamis Anastasi	..	258
Peristeronopiyi	..	Theoklis Towli	..	305
do.	..	Const. K. Haji Yeoryi	..	73
Phrenaros	..	Kyriakos Theori	..	71
Rizokarpaso	..	Nicolas Chr. Barbotta	..	171
do.	..	Pandelis N. Haji Hari	..	281
do.	..	Anna Pavlou Matheou	..	300
Sotira	..	Vasilis Demetri	..	252
Styllos	..	Annezou Nikou	..	269
Trikomo	..	Marikou Kyriakou	..	224
do.	..	Kyprianos Stylli Haili	..	266
do.	..	Patroclus Kyriakou	..	297
Vatili	..	Andreas G. Iona	..	86
do.	..	Vasiliki Haji Christodoulou	..	89
Yenagra	..	Kyriacos Christofi	..	206
Yialousa	..	Christofis Panayi Pitchi	..	280

LIMASSOL DISTRICT.

Anoyira	..	Thoukis Solomi	..	143
Asgata	..	Demosth. Evangelis	..	295
Ay. Phyla	..	Costis P. Silikiotis	..	118
Evdhimou	..	Ahmed H. Shukri	..	303
Pakhna	..	Theodoros Evgeniou	..	121
do.	..	Haralambos M. Kais	..	283
Phasoula	..	Nicolas Evangelis	..	272
Phasouri	..	Cyprus-Palestine Plantations, Co.	..	302

PAPHOS DISTRICT.

Dhrousa	..	Yiannis Sava	..	139
Khoulou	..	Ahmet Kiazim	..	289
Kissonerga	..	Evangelis Haji Nicola	..	126
do.	..	Haji Towlis Haralambou	..	129
Kouklia	..	Mehmed Hassan Kokkinos	..	215
Ktima	..	Ali Arif Kallikas	..	290
Kelokedhara	..	G. Christodoulou Sirimis	..	275
Lapithiou	..	Mehmed Mulla Osman	..	263
Lasa	..	Yeoryios Ch. Ellinas	..	130
Pano Arodhes	..	Harilaos Nicolaou	..	136
do.	..	Chrysost. Panayiotou	..	214

<i>Village</i>		<i>Owner's name</i>		<i>Reg. No.</i>
Peristerona	..	Solomon Haralambou	..	230
Prodromi	..	Avraamis Sava	..	248
Stroumbi	..	Sofoklis Constanti	..	178
Tala	..	Costis Papa Daniel	..	286
KYRENIA DISTRICT.				
Agridhaki	..	Haralambos Yianni	..	147
Asomatos	..	Christallou Michaeli	..	146
do.	..	Antonis Haji I. Hanni	..	150
Ayios Amvrosios	..	Nicolas Haji Dimitri	..	256
Ayios Ermolaos	..	Efstathios Christofi	..	166
Ayios Yeoryios	..	Costis Nicola Spanou	..	157
Bellapais	..	Savas K. Demetriades	..	236
Dhiorios	..	Gregoris Haji Michael	..	148
Dhikomo, Kato	..	Loukas G. Loukaides	..	273
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8th December, 1939.

ROBERT J. ROE,
Chief Veterinary Officer,
Inspector of Horse Breeding.

Department of Agriculture, Cyprus.

HEADQUARTERS—NICOSIA.

ALL general correspondence should be addressed to the Director of Agriculture.

Correspondence and applications for advice referring to the Veterinary, Entomological, Plant Pathological or Chemical Branches, should be addressed to the Officer in charge of the Branch. When seeking advice in regard to treatment of plant pests or diseases, specimens should, whenever possible, be sent.

GOVERNMENT STOCK FARM, ATHALASSA AND DISTRICT STUD STABLES.

Applications for services of stud animals at Athalassa or the supply of live stock, poultry, eggs, etc., should be addressed to the Livestock Officer, Athalassa. Applications for services of stud animals at District Stud Stables should be made to the Stud Groom in charge. There are Stud Stables at Vatili, Rizokarpaso, Ayios Theodoros, Lefkoniko, Larnaca, Paphos and Polis.

CENTRAL EXPERIMENT FARM, MORPHOU.

Applications for permission to visit the Central Experiment Farm, Morphou, should be made to the Superintendent of Agriculture, Morphou.

SAITTA EXPERIMENTAL VINEYARD AND VITICULTURIST'S LABORATORY.

Requests for the examination of wines and advice in regard to viticulture should be addressed to the Viticulturist and Wine Expert, Limassol.

DISTRICT ORGANIZATION.

Applications for agricultural advice should be addressed to the Officer in charge of the district or area in which the applicant resides. All applications for seeds or plants should be made to the Officer in charge of the nearest Nursery Garden.

NICOSIA DISTRICT.

Agricultural Officer, Mr. S. Maratheftis, is in charge of the district, and officers are stationed at Nicosia, Kythrea, Dheftera, Peleokhorio, Morphou, Lefka, Pyrgos, Kalopanayiotis and the Nursery Garden, Nicosia.

FAMAGUSTA DISTRICT.

Agricultural Officer, Mr. A. Panaretos, is in charge, including Famagusta Nursery Garden and Citrus Experimental Grove and Lysi Nursery Garden. Officers are stationed at Famagusta, Yialousa, Lysi, Lefkoniko and Triкомо and Tobacco Instructor at Yialousa.

LARNACA DISTRICT.

Agricultural Officer, Mr. M. Papaiaçovou, is in charge including Larnaca Nursery Garden. Officers are stationed at Larnaca and Skarinou.

LIMASSOL DISTRICT.

Agricultural Officer, Mr. Ch. C. Koumides is in charge and officers are stationed at Agros, Perapedhi, Evdhimou and Limassol.

KYRENIA DISTRICT.

Agricultural Assistant, Mr. E. Alonaris, is in charge, including Kyrenia Nursery Garden, and an officer is stationed at Lapithos.

PAPHOS DISTRICT.

Assistant Superintendent of Agriculture, Mr. A. Klokkařis, is in charge. Paphos District includes Paphos, Polis and Kelokedhara Nursery Gardens and officers are stationed at Polis, Stroumbi and Kelokedhara.

TROODOS AREA.

Trikoukkia Nursery Garden and Experiment Station are in charge of Mr. K. Hamboullas, Agricultural Assistant.

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